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THE PRESIDENT'S OPENING ADDRESS, SESSION 1901–1902.*

It has been customary for the President to address you briefly, at the opening of the session, on the geographical events which have taken place during the recess. I have much to say on the greatest undertaking this Society has ever entered upon, the Antarctic Expedition, and on collateral subjects, but I will take another opportunity of doing so, as we are now all anxious to listen to Sir Harry Johnston.

It would, however, not be right if I did not allude to the losses geography, and especially this Society, has sustained since we last met. Our Gold Medallist, Baron Nordenskiöld, has passed away, if not at an age we hoped to see him attain, still in the full ripeness of abundant, most valuable work. I know of no geographer who has combined such great achievements in the field with imperishable work in the study. The explorer of the icefields of Greenland and Spitsbergen, the discoverer of the North-East Passage, was also the author of the Facsimile Atlas and of the Periplus. He was, without comparison, the greatest authority on mediæval cartography of his generation. In the preparation of the former work, he sought my co-operation; we have maintained an intercourse and correspondence on geographical subjects for upwards of a quarter of a century, and I am among those who mourn for the loss of this gifted man of science as for an attached friend.

Our Vice-President, Admiral Sir Anthony Hoskins, has also passed from among us. This distinguished naval officer took a very warm interest in our Society. We were most fortunate to have secured his services, and to have been able to profit by his judicious counsel. All he did was done very quietly and without ostentation, and few know

* Read at the Meeting of the Society, November 11, 1901.

how much geography is indebted to him. As regards the Antarctic Expedition alone, the important help and countenance it has received from the Admiralty is mainly due to the influence of our late Vice-President. His place will not be easy to fill.

But perhaps our most grievous loss, the loss we feel most keenly, both as geographers and friends, is that of the young and brilliant officer who lately won a patriotic soldier's death near Pretoria. The youngest colonel in the army, no other fact is needed to prove the value of his military services. But it is not for us to discuss them here. We mourn for the loss of young Vandeleur as a trained scientific traveller, as the most promising among the geographers of the younger generation. Older men have done their work, and our grief at their loss is tempered with satisfaction that they have been spared to do so much. But how sad it is to see a bright young life, so full of promise, cut off in its prime! We all remember the days when young Vandeleur told us of his geographical work during the Niger campaign on May 31, 1897, and the account he gave us of Uganda on November 23, 1896. How bright and sympathetic he was, how thorough and painstaking: how certain it seemed to us that in him we had the promise of a great geographer in the years to come! I saw him last when he came home badly wounded in the summer, and found the same enthusiasm, the same interest in his own work combined with sympathy for the work of his geographical associates. The ardent African traveller was a subscriber to the Antarctic Expedition. He went back to his responsible duties full of high hopes and patriotic zeal. Now, alas! all buried in his grave. We have left to us the memory of a splendid career too soon cut short; and future travellers and geographers will derive benefit and encouragement by a contemplation of the life-work of that most gallant and accomplished guardsman, Seymour Vandeleur.

It is now just seven years since we had the great pleasure of welcoming our old friend and associate, Sir Harry Johnston, and listening to his graphic account of his Nyasaland government. We again have the pleasure of giving him a welcome on his return from Uganda, and I will delay no longer in requesting him to address you.

SURVEYS ON THE PROPOSED SUDAN-ABYSSINIAN FRONTIER.*

By Major C. W. GWYNN, D.S.O., R.E.

THE map published herewith gives the main geographical results of the surveys conducted by me in the neighbourhood of a section of the proposed Sudan-Abyssinian frontier during the winters of 1899–1900 and 1900–1901.

* Map, p. 656.

During the first season, assisted by Lieut. L. C. Jackson, R.E., I carried a survey from Roseires on the Blue Nile to Fashoda on the White Nile, joining Major Austin's work on the Baro, about 70 miles in a straight line above Nasser. A reduction of the maps then made has already been published in this *Journal*, with Major Austin's paper.* Since this map was published, I have, however, had an opportunity to determine the longitude of Roseires, my starting-point, by telegraphic comparison of times. The result is to move the whole of the topography between that point and Abajala on the Garre (a tributary of the Sobat) 1′ 41″ of arc to the west. Considerable additions have been made to the map between Dul and the Blue Nile, and the spelling of some of the names has been revised.

Last winter I accompanied Colonel Harrington, the British Agent and Consul-General in Abyssinia, to Addis Abbaba, and proceeded thence to the frontier along the road originally explored by Mr. Weld Blundell, joining my previous work at Fazogli. Having spent some weeks in surveying in greater detail the country between Fazogli and Dul, I turned north and carried the survey across the Dinder and Rahad valleys to Gallabat. Thence, as the rains had well set in, it was necessary to return to Khartum. The most northerly place, which was well fixed, was Doka, and unfortunately it was not possible, in the time available, to rigidly connect that point with the point at Gedaref telegraphically determined by Colonel Talbot, R.E.

The positions of Wad Medani, Sennar, and Roseires are now telegraphically determined, so the considerable error in longitude which existed on all old maps has been eliminated from the position of the Blue Nile. South of Roseires to the Baro,* along the western scarp of the Abyssinian plateau, the longitude depends on a continuous line of latitudes and true azimuths. The position of a number of prominent peaks has been intersected and calculated from a series of latitude bases, and the detail survey has been made on a plane-table working from these points.

The instrument used in this portion of the survey was a 5-inch transit micrometer theodolite, by Messrs. Troughton and Sims. The altitudes given in this portion of the map depend on a boiling-point value for the summit of Jebel Fazogli, from which other altitudes have been worked by vertical angles corrected for curvature and refraction.

North of the Blue Nile to Jebel Doka *viâ* Gallabat, the survey also practically depends on a line of latitudes and azimuths, but in the first instance the distance from Jebel Fazogli to Jebel Gubba, determined from a latitude base, was taken as the base for a triangulation run with a 3-inch transit theodolite to Jebel Belula, south-east of Gedaref. The points on this triangulation were used in the plane-table survey of

* See vol. xvii. p. 572.

topographical details, but the whole was subsequently adjusted to observed latitudes (5-inch theodolite) at Jebel Belula and Jebel Doka. The longitude of Jebel Doka depends on three observed azimuths—Jebel Fazogli, Jebel Abu Ramla, Jebel Halawi, Jebel Doka.

While at Addis Abbaba I had an opportunity of measuring a base 18,298 feet long. From this base a triangulation was carried to the mountains in the neighbourhood with a 3-inch transit theodolite. The latitude of our station was observed (with the same instrument, four pairs north and south stars), and a value in longitude was assigned to it depending on Captain Swayne's value for the camp of the Rennell Rodd Mission, determined by two occultations of stars by the moon.

Proceeding to the frontier, a very rapid triangulation was carried from the points thus determined till the points fixed on the previous survey became visible, and the plane-table survey was worked from

BLUE NILE BETWEEN WAD MIDANI AND SENNAR.

these points. The closing error on the points determined in the previous year was approximately 2′ of arc. In drawing the map this error has been eliminated, and a fresh value for the starting-point at Addis Abbaba has been plotted. As, however, the triangulation was run with a very small (3-inch) theodolite, and many of the points observed to were unsuitable beacons, I do not consider there is any warrant for rejecting Captain Swayne's value for Addis Abbaba. I have not, however, considered it worth while to distribute the 2′ error, as it probably was not gradually accumulated, but was introduced at definite points which there is no means of identifying. The heights given between Addis Abbaba and the frontier are merely aneroid readings. Vertical angles were to a certain extent observed, but the results have not yet been computed.

A list of the points determined is published in the latest issue of accessions to the Intelligence Department list of latitudes and longitudes, and can be seen in the Society's library.

AUDIENCE CHAMBER, PALACE ADDIS ABBABA.

Notes on the Journeys.

Leaving Omdurman on November 19, 1899, Lieut. Jackson and I sailed up the Blue Nile to Roseires with our escort of Sudanese in three gyassas. Owing to the exceptionally low Nile, progress was painfully slow and frequently interrupted by sandbanks.

The men, however, were available for towing, and better progress was made by us than by the boats we passed, which had to depend on the wind only. The river winds considerably, and even though the wind comes pretty steadily from the north, there were few days on which it was favourable throughout. Ten mules were brought from Omdurman, but it became obvious, after the first day, that they could easily keep up with the boats, and they were consequently landed, giving a very welcome amount of room on the overcrowded boats. Short halts were made at Wad Medani and Sennar to fix the position of these places telegraphically, and at the former place we received the news of the Khalifa's death. At Karkoj a large number of donkeys had been collected for our transport, and six weeks' supply of grain was procured there for our journey south from Roseires. The donkeys, seventy in number, were marched without loads to Roseires, and the provisions were carried by water. On December 14 we gladly parted from our boats at Roseires, as our numerous boxes and stores had left us little elbow-room, and the awning, never of the best, had almost disappeared. Rats and cockroaches had increased and multiplied on the voyage, and neither the boat nor its crew had become more savoury. Looking back on the voyage now, however, one can realize the possibility of having a

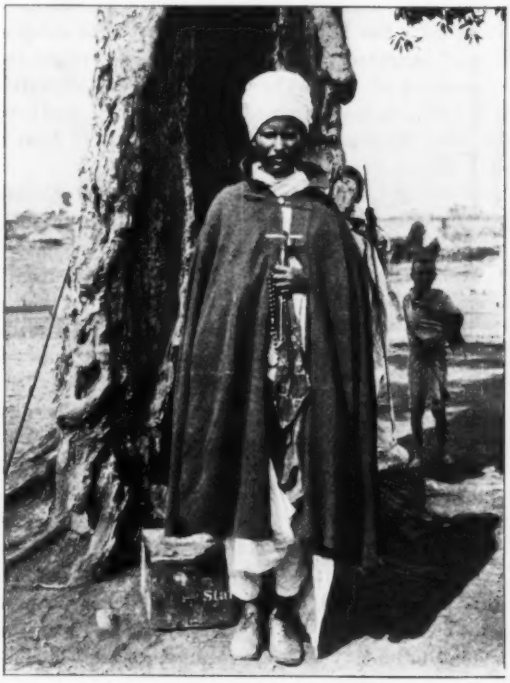
very pleasant trip in a well-equipped boat, with time available for shooting excursions. Much of the river is very pretty, and the myriads of water-birds are an unfailing joy.

Two days were spent at Roseires arranging loads, getting out instruments, observing, etc., and on December 17 we started for Fazogli. From the first all our transport arrangements gave every satisfaction, and our Sudanese worked untiringly under Faraz Effendi, an officer of the 12th Sudanese who had been promoted from the non-commissioned ranks for distinguished conduct at the battle of the Atbara. I regret to say that after his return to his battalion he developed fever and died. The river was crossed at Abu Shaneina in one of the rough-looking but effective native boats peculiar to the Blue Nile—boats which have no framing, but depend for their strength on the planking, which runs up to 3 inches in thickness. A couple of thwarts help to prevent the boat spreading. From Fazogli we worked south through Keili, skirting the foot of the Beni Shangul plateau. Population is sparse, and the races much mixed. The rulers are generally descended from the Fung or other tribes further north, and originally came into the country as traders. The aboriginal races are Bertas

BATTLE OF ADUA: MURAL DECORATION IN CHURCH AT LEKEMPTI.

and Buruns, who live among the rocky hills, their houses wedged in among the huge sienite boulders in the most inaccessible places. The Bertas are the more numerous, and the Buruns live very much scattered,

further out from the foothills. The Bertas are a very black race, large, well made, but slothful and stupid to a degree. Going up to their villages in the hills, one finds them stretched out sunning themselves on the rocks, looking for all the world like great black snails. Funny little black pigs and stringy fowl share the huts on equal terms. Durra must be grown somewhere, but there is little sign of cultivation anywhere among the low-growing forests which cover the face of rough stony country. Of course near the river population is thicker, and a good area is tolerably farmed.



ABYSSINIAN PRIEST, LEKEMPTI.

As far south as Kirin there is great scarcity of water, and no perennial streams are met with, with the exception of one flowing at the northern side of Jebel Dul. The tilt of the strata appears to turn all the water from the Beni Shangul plateau back into the Tumat and Yabus valleys, for one finds delightful little streams running east from the very edge of the escarp. South of Kirin in Amam there is a break in the scarp, and perennial streams run both ways. This country is

well watered, but is thinly populated, and the whole face of the country is covered with bamboo forests. Crossing the Shakadobi range by the pass at Jebel Egu, where the Abyssinian and Galla armies repelled the southern advance of the Dervishes, one leaves the Mohammedan Arabic-speaking regions (Arabic is the *lingua franca*, though there are various dialects among the aborigines) and enters Galla territory. The change of scene is almost as remarkable as the difference in the appearance of the people and their language. There is a dense population, and the whole country is under cultivation excepting on the higher hills, where there are forests of beautiful trees and glades whose bracken and blackberries make one forget he is in Africa. Though the country has been thoroughly cleared for cultivation, sufficient numbers of large trees have been left grouped round the farms to break the monotony of the landscape. This very attractive country extends all round the headwaters of the Yabus and northern slopes of Tulu Wallel into Wallega, though the Yabus itself flows in a wide marshy valley useless except as a hunting-ground.

In contrast to the Gallas found on the outskirts of Somaliland, who appear to have adopted largely the Somali's nomadic life, these Gallas, and all those of the Western Abyssinian plateau whom I have met, are essentially an agricultural people, though they breed fine cattle and a good many horses, the latter of a very light, rather poor class. The farm huts stand close together, but the people do not collect into villages, though in the case of important men the huts of the farm servants almost constitute a village. Throughout the country there are, however, recognized "gabas," or market-places, where markets are held on regular days. The top of a small hill near some big farm is generally selected, and the market is held under the superintendence of the local headman, who decides all questions of broken contracts, etc., on the spot. Practically the Abyssinians have not touched the native organization here, and the old code of laws and customs exists, except that capital cases must be brought to Addis Abbaba.

Up to this point we had been traversing country which had to a certain extent been explored by Schuver, and his work had on the whole been found to be very accurate in detail, though in the southern portion of his map a considerable error in latitude had appeared, while of course many villages had disappeared and others sprang up. Standing at Gobo and looking south towards the Baro, little could be seen owing to the haze, but it was evidently from this point that Schuver had seen the Garre in flood in the neighbourhood of Abajala, which led him to mark Lake Haarlem on his map. Schuver was much liked and respected throughout the country, and a great impression had been produced by his dog, which must have been a big Newfoundland. He is still always spoken of by the Gallas as Abu Sari ("the father of the dog").

At Gidami we came on the tracks of another explorer—the ill-fated Böttego—and our camp was for some time at the foot of the hill on which he met his death. One of his books, a medical handbook, was presented to me, and the natives gave apparently an accurate description of the unfortunate conflict. There can be little doubt that if Böttego had consented to relinquish his design of pushing north to Kassala, and had consented, as the natives desired, to go to Addis Abbaba, no attack would have been made on his party. The Gallas were, however, afraid of incurring the Emperor Menelek's displeasure by allowing an armed force to pass through their country without authority, and consequently attacked when Böttego insisted on proceeding.

GUMZ VILLAGE AT JEBEL MATONGWE.

Leaving the Lega Galla country, we descended the great southern scarp of the Kusai range, which projects like a wall for some 30 miles at right angles to the general line of the scarp to the plateau. Once more we entered an almost uninhabited, waterless tract, and it was with great difficulty that we were able to obtain guides. This is a great elephant country, and, indeed, game of all sorts appears to abound, though, as our provisions were none too plentiful, and the accounts of the difficulties likely to be met with on foot were not reassuring, we did not dare to waste time shooting, but pushed on as fast as possible.

On March 15 we reached the Baro at Kaich, which is apparently

the most easterly Nuer village. To the east our guide said we should have found Nyuaks. The Nuers, in spite of a rather evil reputation, proved most friendly, though we tried them rather highly by appearing in their village without warning at 9 o'clock on a dark night. These eastern Nuers are a wonderfully fine race physically; they are very well built, and must average very nearly 6 feet in height. They are chiefly distinguished from the Nuers further west by the absence of disease, and skins unbroken by the sores and marks which disfigure most African races. Their hair is bleached even a brighter red than that of the more westerly tribes, and it is generally worn rather long and dishevelled. Poor Wellby speaks of the Nuers as being a red-haired race, but of course the colour is due to a bleaching process effected by not very nice means inside a helmet of clay. The result is a brilliant Celtic red. These Nuers are very particular about their night clothing of wood-ash, which gives them a very ghostly appearance as they move about in the morning mists. The heat of the day soon produces quaint river systems over their bodies, uninterrupted by any clothing. Generally speaking, we found the eastern Nuers a very attractive people, bright and intelligent, though absolutely wild men. Further west in the neighbourhood of Nasser, the contact with the Dervish and old Egyptian occupation had produced the elements of civilization, but had made the people much less pleasant.

Few countries could be less attractive than the Baro valley between the Pibor and the foothills. When we traversed it it was a dried-up marsh, and all the grass had been burnt, leaving a thick choking layer of black ashes on the ground. The heat was great, even the nights giving frequently a minimum temperature of 100° Fahr. Still there was no great difficulty in getting through the country, as there would be when the ground was still a swamp and the grass standing. Some 4 miles or so from the river a forest belt indicated the flood limit, and here the Nuers had their wet-season villages and patches of cultivation. Very well built they are, too, and very different from the fishing huts on the river-bank. During the wet season the latter are deserted, and communication from the river to the inland villages would be most difficult.

Owing to the lowness of the water, we had to march all the way to Fashoda, cutting off a corner from Uryong, a most dreary, waterless march across dried-up swamp. Fashoda was reached on April 1, and there two gyassas, returning light from the sudd-cutting party, were obtained to carry our stores and party north. The remaining transport animals were marched along the bank, and the Sudanese, with the prospect of restoration to their families in sight, brought them along at a fine pace. At Goz Abu Guma we were overtaken by Sir William Garstin's steamer returning from the sudd, and April 26 saw us back in Omdurman.

BAMBOO-COVERED COUNTRY, AMAM.

JOURNEY FROM ADDIS ABBABA TO GALLABAT *viâ* FAZOGLI.

On March 12, 1900, I started from Addis Abbaba to Fazogli with a few Abyssinian and Somalis as personal attendants. His Majesty the Emperor Menelek had given personal orders that every assistance should be given me on my way to the Sudan, and his orders were obeyed in the most liberal spirit. Little need be said about the country traversed, as it has recently been described by Mr. Weld Blundell and in M. Michel's most interesting account of the Bonchamps mission in his book 'Vers Fachoda.' That the country to the east has suffered much in the Abyssinian wars is evident when it is compared with the extreme westerly districts, which surrendered their independence without a struggle. I should doubt, however, if at the best of times the more central part of the plateau had equalled the Didessa and Yabus valleys in fertility. To the east and in Shoa the old Galla organization has been completely broken up, though districts and subdistricts bear the old Galla tribal names. At Lekempti, however, Dejajmach Kumsa is a pure-bred Galla, and his subordinates are Gallas too, though he has to support three thousand men of Dejajmach Demasi's Abyssinian frontier army. Here one begins to find the same type of country and state of things as in the Lega Galla country described above. The country is probably quite as fertile, but the population has evidently been considerably reduced. Crossing the Didessa valley, which, like that of the Yabus, is a low marshy game country, one ascends a formidable scarp bounding Wallega on the east. The whole of the southern portion of Wallega is thickly inhabited and fertile, but the northern extremity of the peninsula between the Yabus, Blue Nile,

and Didessa has been depopulated by the Dervish raids. Near the Yabus itself the black population is found on both banks of that river. Owing to heavy rain and pressure of time, I was unable to do anything to amplify Mr. Weld Blundell's interesting discovery as to the course of the Blue Nile, but native report fully confirmed his account.

For the greater portion of the way from Addis Abbaba to Wallega I had the good fortune to travel in company with M. Hugues le Roux, the distinguished French author and journalist, and M. le Baron de Souci, who were travelling to visit M. Ilg's gold-mining concession. I have heard that M. le Roux fully explored the country in the neighbourhood of the Didessa Blue Nile junction, and his exploration will, I hope, do much to extend our knowledge of the topography of this region, which till now has been very indifferently charted.

Passing through Beni Shangul, I reached Fazogli April 13, and, being met by a party of Sudanese under Captain N. M. Smyth, v.c., Inspector of the Sennar district, proceeded to map more thoroughly the northerly portion of the district traversed during the previous year, and to extend the survey in the direction of Gallabat. In the district

COTTON MARKET, GIDAMI.

immediately north of the Blue Nile the aboriginal Guniz tribe lives under very much the same conditions as the Bertas do in the country south. They are a smaller race than the Bertas, but appear to be more active and intelligent. Their rulers are usually aliens. The Gubba group of mountains does not form part of the general Abyssinian scarp, but is an outlying group of very rocky hills intersected by flat narrow valleys. A remarkable feature of the scenery is the number of bare needle-like rocks, some of them, like Jebel Matongwe, rising straight out of the plain. Jebel Abu Ramla is a curious mountain block with an almost crater-like summit and steep sides. We marched east from Abu Ramla up the Dinder valley to Dunkur. The chief village is about in the same latitude as is assigned on existing maps to Dunkur, but this village is really about 10 miles south of the old village, which was consequently very much out of position. In fact, the old maps of this region, both as regards topography and tribal information, are quite worthless. From Dunkur we turned nearly due north and skirted the foothills of the Kwara plateau, which, with the great mountain masses of Jebel Kobai, Jebel Belia, and Jebel Bafa, form the true limit of the main plateau. The country traversed was thickly wooded with low trees even on the hilltops, and thoroughly unsatisfactory to survey. Out to the west, however, the detached hills stood up boldly from the plain and formed good landmarks. The country is thinly, and for many miles entirely, uninhabited, Dervish raids having almost depopulated it.

Gallabat is a place rapidly recovering its old importance, and it is interesting to find that the majority of the inhabitants are settlers (or the descendants of settlers) from Darfur, who, returning from Mekka, have formed a colony here.

From Gallabat we returned by the prosperous town of Gedaref (Suk Abu Sin), which has already recovered its position as a great commercial centre, and thence struck across the desert to the Blue Nile to Wad Medani, where we found a steamer waiting to take us to Khartum. Wad Medani was hardly recognizable as the squalid native town where Jackson and I had spent two unhappy days a year and a half before. At Fazogli the immense difference a little over a year had made in the general prosperity of the district had struck one. There, it was doubtless the sense of security of a settled government which had brought about the change, without any particular effort on the part of the government; but at Wad Medani new buildings and gardens gave ocular evidence of the existence of a government.

NOTES ON THE ANTHROPOGEOGRAPHY OF ARGENTINA.*

By Dr. FRANCISCO P. MORENO.

Our geographical knowledge of Argentina has been considerably increased during the last few years. The Andes have been explored, as well as the Patagonian tablelands and the Fuegian islands. Important discoveries have also been made in the geology, palæontology, and anthropology of these regions. The ancient relations of South America, not only with the antarctic lands, but with Africa, India, and Australia, have been shown, as well as the existence during supra-jurassic times, before the upheaval of the Andes, of a great range of mountains to the west of Chile where the Pacific extends to-day. Palæontology has confirmed these geological relations. The extension of the Gondwana flora to Argentina, and the identity of some South American vertebrates with those of Australia, are no longer matters for conjecture. Changes, also, in the relief of the southern part of the American continent, in the contour of the coast, and in climatic conditions, have been noted in recent times, and some of these results are of remarkable importance when viewed in connection with the distribution of mankind. Without doubt, geographical conditions in prehistoric Argentina afforded unlimited hunting-grounds, arable lands, and homes to vanished races of men. I think, then, that it is not beyond the programme of this section to attempt a general enumeration of the people who once inhabited it.

I.

When, in 1873, I visited for the first time Patagonian lands, I was struck by the number of human types in the graves of the old Indian encampments in the valley of the Rio Negro. It seemed to me that here was a general burial-place of all the American races during their forced migrations to the extreme south of the American continent. Afterwards, when I crossed the Argentine territory, I looked for the races represented in these graves, and little by little I penetrated the great mystery; and comparing the lost races with those existing to-day, by the remains of their industry left to us, and by a knowledge of the geographical environment in which they wandered, it is possible for me to-day to say something which may induce others to take a greater interest in the anthropogeography of South America before the times of Columbus.

I will not discuss the origin of the primitive South American whose remains have been discovered in the Brazilian caves and in the Pampean

* Paper read in Section E (Geography) at the Glasgow Meeting of the British Association, September, 1901.

loess in close association with the bones of extinct animals. The confusion produced as to the epoch of extinction of these mammals by the exploration of the Mylodon cave in South Patagonia would require a long explanation, which time does not permit of to-day; neither will the question be discussed whether this primitive man is of the same type as the Eskimo, or whether he is only a descendant, or whether they are both representatives of entirely different peoples separately developed. But as introduction to this short account, I will only say that the Pampean sea, the Moxos lake of Bolivia, and the Amazonian lacustrine area, so well described at the Bristol meeting, and at the Royal Geographical Society, by Colonel George Earl Church, have had great influence on the geographical distribution of man in the early history in South America. By these broad waters the Brazilian land-mass was separated from the Andean land-mass. There is no doubt that man lived in South America in early pleistocene times, and it is also undoubtedly a fact that during the pleistocene period a great part of that continent had not the same physical features which it bears to-day. Very probably the Caribbean sea had not its present extension. The Andes had not reached their present elevation, and lands existed to the west and to the south-east; these are all geographical features necessary to explain many facts observed in the distribution of man in America.

In the southern part of the Brazilian or eastern region, which very probably was more extensive than at present, the dolichocephalic or long-headed type developed; in the Andean region, the brachycephalic or round-headed type; and a third intermediary type came later on from the Columbia-Venezuela region in the north. The first two types developed separately, till, with the slow decrease of the Pampean sea and of the big lakes, inter-communication was possible. In those times, with the appearance of the pampean loess above the sea, other lands in the neighbourhood sank, the great mammalian fauna commenced to decay, and the Atlantic coast took its present contour (leaving only as proofs of the past existence of the lost lands, the polishing of rocks by wind-blown sands from these lands); sea arms advanced 300 miles to the north of its present boundary, sufficiently deep to allow the passage of whales, and great rivers flowed into the large bays of San Borombon or Bahia Blanca; hundreds of lakes extended on the now low lands, and then men of the east and of the west met, and the mixture of the types commenced.

In that age the climate was different from that of the present. The Andes had not formed their present continuous barrier between the Atlantic region and the Pacific region; vast glaciers still existed in the northern lands, descending to the valleys of the western highlands and giving a damp climate to the arid regions of to-day. In Patagonia the glaciers advanced eastwardly. While the geographical conditions were

favourable to human life in the north, not only men but huge animals could pass easily across the Andes; in the south the ice-sheet closed the field for the development of man, and he only reached the low depressions by the east.

In the Brazilian region dolichocephalic men advanced slowly in culture, tribes were formed, dissensions arose between them, and forced migrations commenced. Some of the tribes acquired more industries than others, which spread over the hydrographic net and along the Atlantic; the remains of this industry, from the Paraguay river to the Amazon and the Atlantic, show the intimate relations between the tribes in early times.

While nomadic conditions governed these eastern men, in the Andean regions brachycephalic men initiated a different culture, adapted to the different geographical features, and created the first settlements. Meanwhile a third type, mesocephalic, advanced from the north, sending its representatives to the east and to the west, during its march into the regions occupied by the two others, and thus new mixtures appeared in race and in culture.

To this third type pertain, I think, the petrographs which have been observed in all South America. I will call the first type the south Brazilian type, the second the Andean type, and the third the Tupi-caribbean type; from these three descend all the old South American tribes. Beside these types other people came to that continent after. Undoubtedly there is a connection between South Americans and North Americans, and also with the peoples of Polynesian origin, but the basis of the entire population was the union of the three types mentioned. I shall not inquire here into the common origin of some of the Pacific Oceanic races with those of South America, or into the similarities which they offer, explainable only by old land connections; but I will merely mention that in the graves of Rio Negro there are human remains that cannot be referred to any living race of South America, but only to those of Polynesia. Some of the skulls from Rio Negro and the Calchaqui region are of Papuan type. Maori stone implements have been discovered at Cuzco in Peru, and at Santiago del Estèro in Argentina; carved wood clubs, entirely similar to those of the Marquesas islands, have also been brought from the ruins of Truxillo in Peru, and from Quillota in Chile, these being preserved in the La Plata Museum, while others have been discovered in Colombia, Ecuador, and other places in Peru. The similarity of some Polynesian monuments with those of Peru is well known, but it is unnecessary to go outside America.

Several of the human types of the Rio Negro pertain to races totally extinct. Amongst these are the Neanderthal and Tasmanian type, others dolichocephalic which is connected with the Botocudo type of south Brazil and to the men of the mounds of Rio Grande and Uruguay. A

third type, mesocephalic, represents the Fuegian type of the Yagan and the Alakalufs which, while speaking two different languages, seem to be of the same race. A fourth type is that of the Onas of Tierra del Fuego. A fifth represents the Tehuelches of the old race; a sixth the great Patagonians or the Ahóneckenkes; the seventh the Gennakens (or the true Pampas); and eighth a type very much resembling the Calchaquis and Huarpes of the north-west part of Argentina. These are normal types, but there are others showing artificial deformations not less interesting. Every kind of skull deformation is represented in these graves—those of the Aimaráes, the Pampean races, the Calchaquis, the old Peruvians, those of the North American Indians, and some also of Central Asia and Europe.

Some of these types represent races that have arrived in Patagonia from the north, following the Atlantic coast. In the burial-grounds which I have explored in the western regions I discovered only the Ahoneckenke, the Gennaken, and the Araucanian type, while some in the neighbourhood of Lake Buenos Aires pertained to the Chonos Indians of the Pacific coast. It is also necessary to say that in the old encampments to the south of Chubut, from which the La Plata museum has obtained a good number of human remains, the number of types diminish. There are in the extreme south only those of natives still existing, which seems to show that the other types became extinct before reaching these latitudes.

I will now try to show who are the present representatives of these men, and the places in which they now live. Of the primitive dolichocephalic type there does not now exist any living individual; it belongs to an extinct race. This is not the case with the first mesocephalic type which is represented by the Yagan and the Alakaluf. I have known personally the two individuals who have been photographed, and can state certainly that they do not in any way answer to the popular idea of the inferiority of these races. They both learned to read and write, took an interest in drawing, spoke a little English and sufficient Spanish. The Yagan was amiable, sensible, and kind, while the Alakaluf was somewhat gloomy, inclined to theft, but kind with children; both were interested in all they saw; the second was extremely skilled in the making of stone arrow-heads, while to the first the La Plata museum owes the possession of many very valuable palæontological specimens. This apparent inferiority is due to the land environment in which they obtain their food, principally by fishing in the fjords in their canoes; but a certain number of Yagans now work in the Argentine settlements of Beagle channel, and several have become good sailors. It is impossible to decide to-day whether these two races proceed from the southern Brazilian stock; but several of their usages undoubtedly belong to a former manner of living. Their masked dance, and ornaments, for example, are remembrances of an old sunny fatherland. In their present

cruel surroundings they are losing much of the better culture brought by their ancestors, and are rapidly becoming extinct.

The second mesocephalic type is that of the Onas, a tribe only very recently known to Europeans. When travelling in Patagonia twenty-five years ago I met more than once some men living with the Tehuelches having an ethnical type different to the people with whom they lived. According to the latter, they were descendants of other Indians. These men were identical with the Onas, and were the issue of men left behind during the migration to the south. It is a matter for conjecture how the Onas crossed Magellan strait, as they do not know the use of canoes, but there are two suggestions to offer in explanation: (1) that they arrived there when a broad glacier and its moraines occupied in part the depression of the strait of Magellan, bridging the continent and the island; or else (2) that they crossed before the formation of that depression. With the Onas, as with the Yagans, their reputation for inferiority is not altogether deserved, and when they have come in contact with the colonists their characters modify rapidly. There are among them, men and women, intelligent individuals, though at first meeting with civilized people they appeared stupid with astonishment and suspicion. The Onas are huntsmen, not fishermen, and undoubtedly their original fatherland is situated further north. The vicissitudes through which they have passed in their migrations are unknown, but it is not hazardous to say that their ancestors lived in more fertile lands. Like the Tehuelches and Gennakens, they hunted in the great plains of the midland of Argentina.

It is not generally recognized that under the Araucanian name of Tehuelches there existed two different types. The old Tehuelches (now extinct for twenty years) were greater in height, of darker complexion, with well-developed bodies, and speaking a different language. The other Tehuelches, of which a few representatives exist to-day, though great in height, are slender in general proportions, and of a type which may have resulted from the mixture of the old one with the Onas and Gennakens. To this type belonged the men whom Magellan saw. I do not think that the old Tehuelches were numerous, and in the burial-places of the Rio Negro are very few of their remains, and I have not obtained others from the ancient encampments or graves that I have examined in many other parts of Patagonia; but the common Tehuelche type is spread over all the southern part of the continent, mixed with Gennakens and Araucanians, and there are proofs of the existence of that race in central Argentina as late as the middle of the eighteenth century. Next to the Tehuelches are the Gennakens, which have many analogies with the Tehuelchean type, but they are of smaller stature, and speak another language. This race, now represented by very few individuals, has had the largest influence amongst the nomadic plain tribes in South America. It migrated from the north, and it

is possible to trace it from the northern plains of Argentina southward to the centre of Patagonia, where its last representatives are now found. These were the men who lived in Patagonia and Tierra del Fuego at the time of the voyage of Magellan; the Araucanians were confined to the two slopes of the Andes between 35° and 41° S. lat., and some few Chonos occasionally passed from the western channels to the eastern valleys by the Andine reaches of the south; the mummified Indian which I discovered in 1877 in the Lake Argentino being the single proof that the enigmatic men bearing the macrocephalic deformation, whose remains I obtained from the Rio Negro burial-grounds, extended as far as 50° south.

The anthropological types which I have mentioned as having lived in the southern extremity of America were men of very low culture, but amongst them, however, were representatives of higher types. There have been discovered in the ancient encampments a few fragments of somewhat elaborate pottery, evidently brought with the migrators, for neither the Pampean, the Patagonian, nor the Fuegian tribes were potters. In the La Plata Museum we have some vessels in a good state of preservation from the Chubut valley, analogous to those used in the provinces of the north-west of Argentina, and with the same have been discovered perforated turquoises, which undoubtedly come from the same provinces, as there, in the old times, this stone was extremely appreciated for use as necklaces and mosaics. Were this pottery and these turquoises brought by migrants, or were they the result of commerce? I am inclined to think that they were brought by the nomadic Patagonian and Pampean tribes in their periodical marches to the north and south.

I have said that amongst the remains buried in the ancient encampment of the Rio Negro were skulls showing a great number of types of artificial deformation skull. These remains caused me to look for the northern races of Argentina. The man represented by the fossil remains discovered in the Pampean mud pertains, as it has been said, to the primitive type discovered also in Brazil, but as we advance further north remains of other men appear, and the tupi-guarani type takes the principal place.

Along the littoral of the La Plata estuary it is possible to follow the southerly march of all these prehistoric races by their remains. It is still a mystery who were the ferocious Charruas inhabiting the Atlantic coasts of Uruguay; whether they were of the Guarani stock or the result of a mixture with the primitive type. Some of their stone implements resembled those found in the Rio Negro valley, and their peculiar stone clubs have also been discovered there as well as in the Chubut valley. In the La Plata Museum there are some stone axes and some zooform stones from Uruguay similar to those discovered in the Calchaqui region, but different to those of

the Brazilian tribes. In the delta of the Paraná have been found burial urns of the same shape as those used by many old Guarani tribes of Brazil, while, advancing to the north, the Minuanes remains of the province of Entre Rios show a race which seems to have come in contact with both the Guarani and Charrua type. Probably the Querandis, who, at the time of the Spanish conquest, were settled where to-day is the town of Buenos Aires, were mixed with Guaranis, as they were huntsmen and fishermen. Further north we meet the Misiones tribes, all of Guarani stock, so tractable that they were easily dominated by the Jesuits with satisfactory results. A few Europeans, not purely Spanish, in a few decades reduced these savages to semi-civilized life. I have seen very good copper etchings made by them, and it is presumable that the numerous carvings in stone and wood in the churches were worked, not by the missionaries, but by native artists. To-day only a few ruins of a past comparative magnificence remain; the Indians have returned to their primitive manner of life, and only quite recently civilized man have reached and again commenced to exploit the country, which possesses richness of soil, magnificent forests, splendid rivers, and prodigious waterfalls. There the poor Indians of Guarani extraction fish and hunt without fear of the Europeans; but the wild Guayaquis, who seem to be the remnants of one of the primitive types, wander in the forest in a low state of culture, identical with some of the migratory peoples which I have mentioned before.

I wish to draw attention to the stone axes of these Guayaquis, made of a stone slightly polished, inserted in a branch of a living tree cut down after the growth has compressed the stone. I know of nothing similar to this among other races.

Going to the west, crossing the Parana river, we met the Chaco tribes, who were very numerous during the sixteenth and seventeenth centuries; speaking different languages and dialects to-day, these tribes are reduced to the Chamacocos, the Matacos, Tobas, Mocovis, and Chirihuanos. Putting aside the Chamacocos, whose culture approaches that of the Tupi-Guaranis, the other tribes seem to me of the same stock as the pampean tribes, differing only in habits due to the lapse of time since their appearance in South America and to the surroundings—the treeless pampa poor in water, or the forest region crossed by many streams. The physical type has, however, so many resemblances that the suggestion of a common origin is not without reason.

II.

When the Spaniards came overland from Peru to Chile from the river Plate to the country which is now the centre and north-west of Argentina, they met different peoples who were more cultivated than the tribes of the lowlands in the east. In what is to-day the Cordoba region, and in Tucuman, they met some agricultural tribes; and,

penetrating to the mountain region, they were stopped by semi-civilized and warrior peoples, the population being great, and agricultural pursuits and irrigation practised everywhere. In the San Juan and Mendoza region, to the west, they also found large agricultural population. Moreover, the ancient chronicles tell us that in the countries settled by these populations there were ruins and other remains of unknown peoples upon which later discoveries have not thrown much light. In the Argentine region bounded on the east by the Chaco forests, on the north by the salt plains, by the pampas on the south, and on the west by the crest of the Andes, numerous sites are found containing specimens of ancient arts and industries. Argentina thus forms one of the most interesting of fields for anthropological research. Proceeding from the south, we see the ancient settlement of Cordoba and San Juan, where beautiful earthenware, human and animal figures in pottery and stone, stone arrow-heads and axes perfectly polished, are exhumed, and not infrequently human remains—the first sometimes in the same bed and at the same depth as the remains of extinct mammals. In Mendoza I have photographed isolated petrographs, remarkably similar to those found in the south-west of the United States, Mexico, Columbia, Guiana, and in Northern Argentina. Further to the north, proceeding along the mountains, the same petrograph becomes more numerous, and in many points rocky walls are covered with these probably mythico-religious figures. In the neighbourhood of the town of San Juan, I have explored some ancient encampments. In the plain were human remains of the type of the common Tehuelches and Gennakens, while in the mountain valleys the remains were of a more advanced agricultural people, and the anthropological type was also different, approaching the Calchaqui of the north. In the lower valleys, close to the eastern foot of the Andes, I explored some very old places in which several bodies were adorned with Pacific marine shells and with wooden ornaments, containing mosaics of turquoises, evidently extracted from a neighbouring hill. The great South American road called "the Incas road" passes along this valley at the foot of the mountains, to the Uspallata gorge, through which it turns westward to the summit of the Cordillera and crosses to Chile. Stone walls are in every part by the side of this road, and numerous petrographs show that the road was made by the same race who used to carve the stone.

This so-called "Incas road" was, I believe, built before the Incas settled in Peru. Moreover, in the Andean gorges I have seen extensive ruins where to-day life is extremely difficult or impossible during a great part of the year, and extensive irrigation works are to be seen where to-day one could not possibly find a drop of water, showing that the climatic conditions of these regions have changed, and that the waters must have diminished. It is known that a century ago the small lakes of Guanacache, between San Juan and Mendoza, were much

more extensive, and that the Indians navigated them in the same manner as they navigate Lake Titicaca at the present time. In all these regions I have neither seen nor heard of burial urns. If we ascend from the regions of Cordoba to the Andes northward, we arrive by the east at what is to-day Santiago del Estero and the eastern slope of the Aconcaguan ridge. I have pointed out that in the Paraná highlands to the north there were Indians who were accustomed to bury their dead in urns, and when in 1876 I studied some ancient encampments on the banks of the Rio Dulce, close to the town of Santiago del Estero, I discovered with surprise some urns made of a rude material containing bones. Close to these I found an enormous quantity of broken pottery, of workmanship I have never seen before in Argentina, but similar in colour and drawings to some ancient pottery of the Shiwi of North America. From these urns I obtained a well-preserved skull, and another not so well preserved, the first of the deformed type, resembling somewhat those of the Rio Negro in Patagonia, and those of the Calchaqui, Ancon, and Chinnooks of North America, but more exaggerated; the second seemed a normal skull of the mesocephalic type, and inside the urn were some marine shells of the Pacific ocean. One axe in stone of the general Calchaqui type, and some other carved stone, I obtained from a cave in the neighbouring hills, and I was told that these caves were to be found in large numbers, and that all had been inhabited by men. It was near this spot that a Maorian stone club was discovered. Afterwards I discovered that these ancient settlements continued to the north-west, and we have in the La Plata museum very interesting specimens, notably a great burial jar, showing the holes drilled in the bottom, as was the custom amongst the Shiwis of the south-west of the United States. The man buried in it was of a type very different to those of Santiago and Calchaqui, and mixed with the bones I picked up a small piece of lead with an iron handle, the only piece of that kind that I have ever seen. The iron has not been analyzed yet, so I cannot say whether it is of meteoric origin not uncommon in the region. Continuing by the east of the mountains, we arrive at the Salta and Jujuy region. There is the gate from the high plateau of Bolivia and the headquarters of the old Juris, the "taller and darker men" mentioned in the first chronicles. There the remains of ancient inhabitants are more numerous, and their implements and bones show that there was a population composed of Calchaqui, Chirihuano or Tupi-Guarani, Patagonian, the so-called old Aimara, and Peruvians. West of this region is the valley of Guachipas, by which the Calchaqui easily reached the open country; to the north and north-west is the road of Humahuaca, and the Rinconada whence gold ornaments have been obtained. These were the ordinary routes taken by the Spanish during the earlier years of the conquest. It is impossible to say whether the Juris, as the name seems to indicate,

were one of the Patagonian types,—"the Ostriches," which the pampean Indians have hunted so much, because the aboriginal settlements of that part of America are so old; but it may be that the populations who met the Spanish in that corner were the result of a mixture of many races. Doubtless they included the same tupi element met with in the eastern side of the Andes from Columbia to the extreme south.

I will now say a few words on the more interesting general type of the Argentine native population, the Calchaqui, who merit more attention than they have hitherto received from geographers and anthropologists.

The eastern side of the southern prolongation of the Bolivian Andes in the north-west is wooded and well irrigated by nature, and slopes gently to the pampean and Chaco plains; but, crossing the high mountains of the Aconquija range, penetrating by the valley of Guachipas, or to the south by the dry salt plains of the Llanos of San Juan, La Rioja, and Catamarca, the traveller will see regions of very different aspect. A series of parallel ridges, very seldom wooded, sharp, and reaching sometimes 18,000 feet altitude, runs north to south as the termination of the central Andes of Bolivia. To the east is the long valley of "Calchaqui," extending from the Argentine-Bolivian high plateau in 22° S. lat. to the transversal ridge of Capillitas in the centre of the province of Catamarca. To the east of this valley rises the chain of Aconquija, and to the west the snowy border of the Puna of Atacama. The valley is sometimes narrow, sometimes broad, with subsidiary valleys which communicate with the Puna of Atacama on the west, with Salta and Jujuy region on the east, while towards the south it expands into a dry basin in which end other small valleys from the north and west, and to the south-west it narrows into a gorge communicating with the vast ancient lacustrine basin of Catamarca. The Puna plateau highland, the lowest point of which is at an elevation of more than 10,000 feet, is covered to an extent of nearly 60,000 square miles by some low ridges half buried in the ashes and lava of hundreds of volcanoes, several of which reach an altitude of 20,000 feet, and are still active; salt dry lakes, where borax is now being dug, also lie in this region. To the south of the Aconquija knot is the valley of Singuil and Catamarca, which ends in the salt plains of Rioja and Cordoba. To the west the Ambato chain separates from the broad old lacustrine basin called las Salinas of Catamarca, in the north-east corner of which is Andalgala, and in the north-west corner Belen, at the gate of the gorge before mentioned, and Londres, of Catamarca, a very humble village so named by the Spanish conquerors when Philip II. of Spain was husband to Mary Queen of England.

To the west and south-west stretches a mountain ridge, with a projecting spur to the south; the latter is cut by the river of Tinogasta,

and is known as the Sierra de Velasco. At its eastern foot lies the town of La Rioja, and further east the valleys of Vinchina and Tinogasta. The latter extends south-west into the province of San Luis, which is bounded on the west by the high chain culminating in Mount Famatina, which is 20,000 feet in height. The valley of Tinogasta communicates with the western depressions. The narrow gorge of Watungasta across it was the best route in early times to Copiapo, in Chile, and thus in its entrance was a Calchaqui military post. To the west lofty mountains, generally volcanic, reaching an altitude of 22,000 feet, and deep salt depressions render permanent settlements impossible. To the south and west of Famatina chain open the long valleys of Vinchina and other narrow valleys running west, carrying the waters of the whole region southward to the great basin of the river Colorado, which, however, does not reach the Atlantic.

All these lands are arid and volcanic, in great part broken by old erosive action, having a desert appearance similar to the south-west regions of the United States of North America and the north-west parts of Mexico. The vegetation where irrigation has not reached is poor, and the predominant tree in the lower plains is the algarrobo or carob tree. In the highlands volcanic rocks predominate, and the scenery now seems that of a dead world. With their black and grey lavas, ashes, and sharp broken stones, which running water has never smoothed, and strong winds blowing almost continually, these dreary, broken lands are apparently unfit for permanent human settlement; but that has not always been the case. My duties have taken me several times to many of these plains, valleys, gorges, and summits, and in every part I have seen proofs that it was once settled, the climate being then mild and temperate.

I have said that the Calchaqui valley, properly so called, extends from the Argentine-Bolivian high plateau to the south. Northward, where the land reaches an average elevation of 10,000 feet, there are remains of very large settlements once occupied by mixed races of so-called Calchaqui, Aimara, and Peruvians. Calchaqui civilization commences for my purpose in the region to the south of the gap of Acai, which is an elevation of 15,000 feet. In 1893 I visited that region, penetrating to it by the gorge of Belen; I ascended the high plateau of the Puna to Antofagasta de la Sierra, descended to the east to Calchaqui valley, and, following it to the foot of the above-named gap, I came again to the Puna, reached Mount Zapaleri at 22° 15′ S. lat.; then, returning straight to the south, again reached Antofagasta de la Sierra, visited the Calchaqui ruins near the poor village, went westward across the crest of the Cordillera de los Andes, and, turning again to the south-west across that dead region, reached Tinogasta, in the province of Catamarca, along the longitudinal valley. In 1876 I had reached the gorge of Belen, coming from Santiago del Estero, passing

by Catamarca, Pilciao, and Andalgalá; and in 1895, penetrating from la Rioja, I examined the western valleys and the south of the high volcanic plateau, till I reached the place I had arrived at in 1893. I then returned to Tinogasta by the narrow gorge of Watungasta before mentioned, and thus am acquainted with nearly all the Calchaqui region, in which traces of that former American civilization may be seen to-day.

I do not think that the remains which are found in every part of that region all pertain to one race or to one epoch; but, on the contrary, they belong to many epochs and to different peoples representing many centuries of human settlement, the latest peoples being subdued by wild tribes who came from the east and south.

At the eastern foot of the mountains every day specimens of human culture are discovered, sometimes very deep, in the open ground close to the stream. Numerous hollows in the rocks show that long ago corn and algarroba beans were there pounded; burial-grounds are met everywhere, and their contents show not only reverence for the dead and their religious beliefs, but also great skill in pottery. Stone hammers and axes are very common, and animal forms carved in stone, sometimes in hard basalt. In the caves and rocky walls carved and pictured figures, still enigmatic, are preserved, and from time to time great boulders covered with the same are found. These evidences of a cultured and artistic people are more numerous in the valley near the town of Catamarca. The proofs of a large population are observed at once; from the old settlement of Chumbicha at the south end of the valley, to the Pucara at the base of Mount Aconquija, archæological discoveries are daily made, including objects in copper and sometimes in gold. The ruins of towns and villages are still visible, and when the traveller has reached the high hills of Singuil and arrived at the narrow gorge of Pucara, dominated by the extensive ruins of that name, he has passed across a country that once formed a continuous line of villages and busy towns, bordered at the two sides by massive mountains and defended at the extremity by the military posts of Chumbicha and Pucara. Pucara is undoubtedly the largest ancient fortress of Calchaqui, and I think that its purpose was to defend the valley of Catamarca and the western one from the invasions of the peoples of the eastern plains of Tucuman and Santiago, although it was unable to check them, according to old traditions. I have passed some days among these interesting ruins, the walls of which extend for nearly 2 miles, dominating by 1000 feet another valley situated to the north, enclosed by mountains, and where the remains of walls and agricultural grounds show that the population numbered tens of thousands. To-day the waters of the valley are scanty, and used only by a few descendants of the natives, possessing only a few goats and a little maize. In former times rains must have been frequent and water more abundant than it

is to-day, as there are still visible small grounds in the rocky slopes which have been cultivated by natural supplies and not by irrigation, which would have been impossible.

Passing from Pucará to the west across the dry abrupt chain of Ambato, is an extensive old lacustrine basin of 5000 square miles, bounded by mountains on the east, north, and west, and by low hills in the south. I visited the foot of the eastern side, and can say that the small water-supply existing to-day (scarcely sufficient for the needs of the small villages) would have been insufficient for the former large population. Their remains extend in every direction, even to the middle of the old lake, which is reduced to-day to some salt deposits, though flooded during the rainy season. It appears as if the settlements encroached on the lake during the process of evaporation, for in the bottom of this lake, in the middle of the wood of Algarrobos, is found the Ingenios of Pilcias and Constancia, where the rich copper of the mines of the northern mountains is smelted. The workers and woodcutters frequently brought to the establishment specimens of ancient industry, and discovered old settlements and burial-grounds in districts where now it is necessary to carry water for drinking purposes. Only in the north-east corner of this former extensively cultivated basin is any extensive cultivation to-day. In Andalgala the best wine of Argentina is produced, and other choice products. To the west of the lacustrine basin are the ancient settlements which bear to-day the names of Belen and Londres, and to the south-west the not less prosperous Tinogasta, closing the valley of its name.

This old lake received the waters of another basin to the north from the gorge of Belen. I have passed through it many times, and believe that it would be a good investment for an irrigation company to dam the water that passes through the gorge, giving back to the adjacent region its past agricultural activity. Extremely interesting are the small valleys near the northern entrance to the gorge, and there I have made collections which show how mixed were the people who inhabited this part in past times. At Yacutula I discovered in a burial-ground the extreme of the two human types, the most normal dolichocephalic skull and the most normal of the brachycephalic ever seen in Argentina; the first was that of a woman, probably a slave, whose bones were broken probably at the moment of death, and the second was the skull of a man, buried in a painted jar.

In La Puerta I found the most artistic black pottery now in the La Plata Museum, and a beautiful mortar adorned with two lizards. In San Fernando and Corral Quemado I had proof that the bronze implements which are frequent in the Calchaqui graves, were not foreign, but were smelted and cast on the spot; I discovered some casts and the slag from the melting-pot.

Hualfin contains one of the most important ruins in Catamarca; it

was the headquarters of part of the Calchaqui army, and the centre of a great agricultural district. Hualfin has been in that basin what Pucará, on the road between Andalagalá and Tucuman, was—the western fortified gate of the Calchaqui civilization. The slopes of the mountains that enclose the southern basin are rich in ruins of towns and villages. The western slope of the Aconquija is covered with them, and in the central valleys there have been discovered megalithic monuments which seem to have preceded those of Tiahuanaco, on the shores of Titicaca.

In the valley, and in the mountains that close it in to the west, are still more ruins of forts and towns, once agricultural centres. In every gorge, in the mountains, in every small valley at their foot, are seen ruins, and more ruins. I will mention only those of the Cajon ridge to the east and west, where nearly all the abrupt slope is covered with walls and steps, where the natives sowed their crops and protected themselves by numerous military posts and forts. To-day very little water runs at the foot. Famabalasto and Fuerte Quemado are steep ruins, the existence of which implies a much damper climate; so also do the remains of agricultural districts and towns of Santa Maria, Villarica and Jujuy, some in the low plains, others in the top of small tablelands, or "mesas," all of them to-day cut by deep ravines. There we have a scenery which reminds me of what I have seen in the pictures from North-West Mexico and Arizona, and Dr. H. Ten Kate, my travelling companion in 1893, who had visited those regions and the ruins of the ancient civilization of the Shiwi or Zuñis, was astonished at the similarity of the two landscapes, and the same characteristic features may be seen all over the north-west regions of Argentina.

In the neighbourhood of Santa Maria will be found the chief remains of the Calchaquis, and Fuerte Quemado is indeed the most interesting of its ruins; these are situate on the top of a precipitous hill, with steep access by a single narrow passage. The most extensive ruins are those of the ancient town of the Quilmes, a little to the north. Here are the stone walls of thousands of houses, overgrown to-day by cacti and bushes. The museums of La Plata and Buenos Aires have obtained excellent collections of specimens from these ruins. Tradition says that the Quilmes were not Calchaquis, but of Chilian descent, but I have seen no evidence to justify such a tradition. To the north of Quilmes, the traveller continues to meet with ruins at Colalao, Tolombon, Cafayate, Molinos, Payogasta and in every little village, or wherever there was a probability that man could settle.

Copper instruments have become more numerous in that part of the valley, as also in the vicinity of Salta and Jujuy. Calchaqui ruins in the west are found at Antofagasta de la Sierra and at Antofalla. In the valley of Antofagasta de la Sierra to-day there are scarcely fifty inhabitants. Antofalla is deserted; only occasionally an Atacama Indian

is seen there, keeping some goats and llamas, but in the time of the Calchaqui occupation an extensive population was located there. I visited the ruins of Antofagasta, and the photograph that I took gives a good idea of them, as well as of the barren aspect of the land to-day. There are small streams that empty themselves into a little lagoon at the foot of the two recent volcanoes, which spread their lavas in the middle of the lake, now nearly dry. The climate does not allow of any other cultivation, in very small patches, than a sort of clover, which is not indigenous, and which grows in extremely poor conditions. In the time of former settlements there were cornfields and irrigating channels, while among the ruins of the town, and in the black lava, I have discovered foundries and small melting-pots and broken casts for beautiful bronze disks.

In Antofalla one of my assistants made interesting discoveries of a Calchaqui settlement. Passing to the southern and northern region in the western volcanic region and in the valleys, the ruins and the burial-places are common in every part where waters existed in old times. Human settlements have been discovered at a height of 18,000 feet.

III.

All that I have said in this paper shows how interesting is the anthropogeography of Argentina, and how many human problems are connected with the geography of the southern extremity of America.

First, we have the remains of man who lived when the continent had not acquired its present relief and contour; next, this man developing, commenced his migrations, while another man appeared in the regions of the west at the end of the Glacial epoch; and we have seen the old people pushed to the south, where to-day we meet their descendants, and amongst them we note an extraordinary variety of types never observed in any other country of the world. We see man living in caves with extinct mammals, as man lived in European caves of the Pleistocene period, and other people migrating from the northern extremity of the American continent. We find Polynesian anthropological elements mixed with the Patagonians; Polynesian culture amongst Calchaqui and old Peruvian culture. Advancing in time, we find a complicated civilization which is impossible to refer to any known type, yet presenting an astonishing similarity in some respects with that of people who lived in the same latitude in the northern hemisphere, and in a land of similar physical conditions. There is a remarkable analogy between the petrographs extending from Arizona to Patagonia, on both sides of the Andes, and between the industrial arts and myths. In intermediate countries there are identical analogies with races of the south and of the east. In Bolivia the ruins of Tiahuanaco and other similar ruins have no antecedents—the people to which they are referred, the one that used the macrocephalic deformation,

has its representatives from Vancouver to Patagonia. In the old Peruvian pottery the human types are not all those of the natives of to-day, but those of Patagonia, Tierra del Fuego, and Chile—in this same pottery Mexican types appear represented as prisoners. Several small artistic terra-cottas, so common in the old Mexican towns, have been discovered in the pampas of Buenos Aires, while other Mexican objects are the same as some of Calchaqui; Calchaqui remains extend from the Atlantic to the Pacific, and from Patagonia to Peru, and inter-Andean trade existed in those remote epochs, showing the enterprise of the peoples which maintained such relations across so great a barrier. When we remember all these facts, we cannot but believe that man has existed from a very remote period in South America, and that inter-continental and, more, interoceanic communications have been maintained from prehistoric times until the day that the Spanish conquistadores continued the work of the wild tribes in destroying the older prosperity when other civilizations commenced to decay.

Now, who are the Onas, the Tehuelches, the Gennakens, the Araucanians, the Misiones and Chaco tribes, the Calchaquis? It is impossible to answer this to-day. I have indicated the importance of these investigations in the hope that it may conduce to the solution of these problems, but I begin to think that we are already in presence of the elements which formed the old and lost civilization, the ruins of which are spread over the whole continent of South America. The anthropologist, treating of North America only, and ignoring what can be seen in South America, supposes that the latter continent was peopled by the races of the former, and that the ancestors of the Pueblos were also the founders of the old civilizations of Peru and Bolivia, but I think that the South American origins are the older, and that there is ample evidence to support my contention. I remember that the science of palæontology has demonstrated that the pampean mammals migrated from south to Mexico and the United States, and it is not impossible that men may have taken the same northward route. It is true that the mastodon is a European and North American mammal, but it is not to be forgotten that its remains are also abundant in South America, in beds of the same age as that of North America and Europe.

Undoubtedly the study of the geographical conditions of South America during the latter part of the tertiary age and the commencement of the pleistocene period will help very much to the solution of so many interesting problems.

HOW ARE WE TO GET MAPS OF AFRICA?*

By Colonel Sir T. H. HOLDICH, K.C.B., C.B., R.E.

At the meeting of the British Association which was held at Bradford in the year 1900, a committee of the Geographical Section was formed for the consideration of certain general principles which should be adopted in developing the mapping of the African continent, and which would ensure (*inter alia*) that full use should be made of all the geographical material which is gradually being amassed, not only under Government direction, but by independent travellers working in the interests of the Royal Geographical Society.

The resolution which that sub-committee presented at the Glasgow meeting of the British Association this year is as follows:—

The Survey of British Protectorates.—Report of the Committee, consisting of Sir T. H. Holdich (*Chairman*), Colonel G. E. Church, Mr. E. G. Ravenstein, *and* Mr. H. N. Dickson (*Secretary*), *appointed to draw up a Scheme for the Survey of British Protectorates.*

Your Committee are of opinion that a representation should be submitted to His Majesty's Government in support of an organized scheme for surveying British Protectorates in Africa, and that it would be advantageous to secure the co-operation of the Royal Geographical Society, and of other bodies unconnected with Government who may be specially interested in the matter, in bringing forward their proposals. At present, various surveys have been commenced in different parts of Africa under local administrations, which are unconnected with each other and have apparently no common basis of technical system or scale, from which it will be difficult eventually to compile a satisfactory and homogeneous first map of our African possessions. A large amount of geographical work, carried on more or less under the auspices of the Royal Geographical Society, is gradually accumulating, all of which might be usefully turned to account in a general survey scheme, if uniformity of method and scale were adopted. A comprehensive scheme of geographical survey (apart from special surveys for local requirements), to be carried out jointly with other nationalities in the continent of Africa, will undoubtedly prove a necessity in the near future for purposes of boundary demarcation and administration; but such a scheme must emanate from those responsible advisers of Government who are best acquainted with the opportunities for combined action and the means for carrying it out.

But, pending the adoption of such a scheme, and with due appreciation of the value of the disjointed efforts which are now being made to secure partial surveys for administrative purposes in various parts of the country, your Committee are of opinion that the following considerations, none of which involve immediate financial outlay, should be especially brought to the notice of His Majesty's Government; inasmuch as immediate attention to them would undoubtedly tend to hasten the attainment of the end primarily in view—viz. the construction of a homogeneous and consistent geographical map of that part of Africa which affects Imperial interests.

(1) The advantage of a common scale should be impressed on local administrations who have already commenced surveys within the protectorates under their

* Map, p. 656.

administration, and every effort should be made in the first instance to secure a general map on the smallest geographical scale which can be made practically useful for purposes of either administration or strategy. This scale should not be less than one in five hundred thousand.

(2) Inasmuch as all future surveys, on whatsoever scale, must ultimately depend on the accuracy of the initial base measurements if they are to fit together into one homogeneous map, it is most desirable to draw the attention of local administrators to this point; and, wherever local surveys have already been commenced, to test the accuracy of their linear measurements by the adoption of a geodetic base. Such a base need not be measured by the cumbersome processes which have made the measurement of geodetic bases so laborious and expensive in the past. New methods and improved means have lately been introduced which greatly simplify the work, but there is no method which does not require scientific direction. It would, therefore, be advisable that the same instruments, under the same personal supervision, should be used in every case. Unity of scale and of linear measurement is absolutely essential to final compilation in such vast areas as Africa presents, and much good work now in progress may be rendered valueless for general map-making purposes if such unity is not secured *ab initio*.

(3) It is the earnest desire of the Royal Geographical Society that those travellers and explorers who use their instruments and accept their assistance financially should add to the practical outcome of mapping material in Africa. For this purpose the Society has established training classes in practical geography, and keeps a record of the names of those who are qualified to work as geographical surveyors. But in order to utilize their work to the fullest extent, it is essential that the geographical data determined by such professional surveyors as from time to time are sent to Africa under the direction of the Intelligence Department should become generally available; and it is therefore most desirable that all such material (indispensable for the proper location of field surveys and for check on final positions) as may be collated at the Intelligence Office may be placed at the disposal of the Royal Geographical Society. Attention should very specially be drawn to the great amount of geographical mapping (at present disconnected and wanting in topographical detail) which is annually turned out by irresponsible travellers. The value of this might be largely increased if it were based on exact data.

(4) One of the most important factors in dealing with the vast area of our African possessions in the matter of geographical (or first) surveys is the absolute necessity of resorting to native agency for its topography. Effective topography can never be secured without the assistance of surveyors and draughtsmen specially trained to this particular branch of map-making. European agency (except for purposes of supervision) is out of the question on account of the expense. Indian native agency is equally impossible for more than comparatively restricted areas. The vast mass of African mapping must be secured through the agency of natives of Africa, just as Asia has largely been mapped by Asiatics.

There is apparently no reason why natives of Africa, trained in mission and other schools, should not be as effective in the field of survey as Africans generally have proved in the field of arms.

It is suggested that in the earlier stages of the formation of such an agency scientific societies might be willing to take the initiative. It is to the interest of the Royal Geographical Society, for instance, to secure the assistance of native topographers for explorers. What is immediately wanted is the initiation of a training school; and it seems probable that, if one or two promising pupils were selected from each protectorate for training, an invaluable school would in a few

years be established, which would rapidly extend of itself. The Commissioners and Administrators of our African Protectorates might be requested to assist in the experiment by ascertaining whether volunteers from the native schools can be found for the purpose. Every assistance to such a scheme may be confidently anticipated from the Indian Government, who have long had practical experience of the enormous advantages of native labour in the field of surveying.

This resolution will in due course be submitted by the British Association to those Government offices, societies, and administrative centres, both at home and abroad, which are concerned in the survey of Africa. Meanwhile a few words in the R.G.S. journal, explaining in rather fuller detail the object of the proposals embodied, and the manner in which the Royal Geographical Society may be able to further those objects, may be useful.

We have, first of all, to recognize the fact that the field of geographical enterprise presented by the *terra incognita* of Africa is growing exceedingly narrow. There are no more sources of mighty rivers to be traced out; no more "Mountains of the Moon" to be set on a geographical basis; no more big lakes to be dubbed by royal names; and no more regions of outer darkness to illumine. We have arrived at a day of comparatively small things, a prosaic day of patient local enterprise, of regulation Government surveys, and of contracted geographical exploits under Government direction. And just in proportion as we have a narrower area to work in, we require more solidly accurate and scientific geography to fill those areas. In short, the geographical work of the future, whether under Government supervision, or in the hands of the more or less irresponsible explorer, should possess those technical qualities of accuracy, breadth, and style which will entitle it to take its place in the finished first map of the continent. Such work may appear to be rather beyond the attainment of the average traveller; and it might even appear desirable that the Royal Geographical Society should rest content with the magnificent achievements of the past, and leave that which is still uncertain in the physiography of Africa to the surer, more accurate, more scientific, and infinitely slower processes of Government professional survey. But we have had instances enough lately to prove that accurate and scientific geography is not at all beyond the reach of the ordinary educated traveller, provided he has proper means and assistance at his command; and we have only to examine carefully the new map of Africa,* and measure up those areas which have yet to be mapped, to realize that its requirements are still so enormous that if we wait for the slow tide of regulation surveys to cover the unfilled spaces of the continent, we may wait a very long time indeed. Referring only to those districts of Africa which are more or less directly under the British protectorate in the Sudan, East Africa, Central Africa, South Africa, and West Africa,

* See Mr. E. G. Ravenstein's map, appended.

we find that there cannot be much less than 2½ millions of square miles of territory which require accurate geographical mapping for military and administrative purposes. This, of course, implies that we do not trouble ourselves about districts under the protection of other European powers than that of England, only confining our attention to territories about which it is absolutely essential that we should possess accurate information. It is difficult to compare this mass of prospective mapping with any results achieved elsewhere under conditions sufficiently similar to justify the recommendation of definite methods in order to attain similar results. Probably the general physiography of Africa, and its conditions of life (regarded from the surveyor's point of view) more nearly approach those of Asia than they do those of Europe or America. It is true that in Asia our direct national interests do not extend anything like as far. All the peninsula of India, including the Native States and Burma, with the Himalaya on the north, hardly cover a million and a half square miles. If, however, we include the trans-borderland of the west, and the trans-Himalayan plateau or highland country (all of which is directly related to India, and has already fallen within reach of exploratory survey), we shall more nearly approach the weight and value of that huge geographical enterprise which lies before us in Africa, and we may find ourselves finally justified in drawing on our Asiatic experiences for certain general deductions to guide us in tackling the great African problem. It is idle to make comparisons between the physical conditions of Asiatic and African geography; equally idle to balance the idiosyncrasies of the Asiatic races against those of Africa, considering the enormous area of infinitely varied physical aspect and the wide diversities of race and nationality which distinguish both continents. Special methods to meet special conditions will be requisite in Africa just as they have been needful in Asia. It is only possible to indicate the general character of those methods of map-making which are likely to be just as applicable to the greater part of the African continent as they have proved to be in Asia. One thing at least is clear, *i.e.* that every factor that can be utilized to multiply the great sum of geographical map making in Africa should be utilized to the very utmost.

The first, and perhaps the chief, of these factors is to be found in those Government surveys which have already been initiated in many parts of the continent, and which are to be carried out under a recognized system of technical detail which will ensure a high standard of accuracy in the field and of final expression in the shape of maps. With this organized system—or rather with those many units of it which at present appear to be independent of each other and of any central control—the Royal Geographical Society has little to do. It involves, in the first instance, an elaborate programme for a "geodetic arc" which is to extend from "the Cape to Cairo," the triangulation

of which is to be carried out with all the rigorous attention to minute accuracy that the science of geodesy demands. This scheme of initial triangulation is to serve two purposes. It is, in the first place, to assist in the final determination of the exact figure of the Earth—a purely scientific purpose of the highest interest to mathematicians, but one which is never likely to have much practical effect in revising the world's mapping. This is strictly the "geodetic" aspect of it. But it should also serve the purpose of a great continental backbone to a general system of triangulation extending therefrom into all parts of Africa. In itself it will only cover a narrow width of country somewhere about the meridian of 30° E. long., but it will furnish the basis throughout its length of points exactly determined from which other triangulation of a more or less rigidly accurate nature may spring. From this point of view it is a practical necessity. No country in the world that professes to illustrate its physiography with maps of scientific accuracy has ever been able to neglect it. The want of it, even in comparatively restricted areas, has only landed the governments concerned in uncertainty and confusion, which have led to delay and expense in all forms of economic development. From these other less rigid systems of triangulation which spring from the geodetic arc there will spring again yet minor systems, until the whole country is covered with a network of points; and finally the topographer will be introduced to complete the mapping. This is the ordinary process of survey evolution where accurate and satisfactory mapping on varied scales is necessary for economic purposes; and it need hardly be added that it will be just as necessary in Africa as it has been found to be elsewhere. But all this systematic and regular process of survey must be initiated and directed by Government, and it will necessarily be a slow and tedious process. Money must be raised for it, and a trained staff of officers and assistants organized to carry it out. It will take some years to train a really efficient staff of topographers alone; and if we are to judge by the average rate of progress maintained in the past, when systematic surveying of this nature has been adopted, we could not reasonably expect to possess even a first map of all our African protectorates on a scale sufficiently large for military or administrative purposes within the next half-century at soonest. But whilst all experts are prepared to maintain that the primary basis and support of a well-constructed survey, covering such a vast area as is presented by our African protectorates, must be triangulation of a nature which can claim to be called geodetic in the strictest scientific sense of the term, they do not all of them advocate the principle of waiting for the first mapping of these important states until that geodetic basis is complete. It would be well, no doubt, if so satisfactory a bed rock for all subsequent operations could be secured, but the demand for maps of such a class as will serve the purposes of administration, of public works, or

of military movement is far too urgent to permit of the delay that must be involved in preparing it. Accurate *geographical* maps are the great necessity of the present, and there is not an administrator in Africa who is not crying out for them and doing his best to get them. Thus it happens that there is a vast amount of mapping already in progress—some of it under Government direction, and some of it colonial—which (good or bad) will form another factor in the final sum of African map-making. All of it is equally independent of that geodetic basis which has been claimed as the *sine quâ non* of a continental survey, and the question arises whether all this material can be finally pieced together and fitted into the complete map product without confusion and difficulty when the time comes for the inevitable compilation.

This depends on what other system of triangulation, or what substitute for triangulation, has been made use of in the absence of the strictly geodetic class; it also depends, to a certain extent, on the adoption of unity of scale and of linear measurement throughout the varied areas of survey. It is to these important points that the resolution of the British Association was designed to draw the attention of those administrative authorities under whom scattered surveys in British protectorates are now being pushed forward; and there is reason to hope that administrative authorities of foreign territories adjoining those of England will also recognize the advantage of these proposals, tending to the attainment of a scientifically accurate map of Africa as a whole. But the colonial surveys, which are already far advanced, have not recognized these principles. Strange as it may seem, although South Africa (*i.e.* Cape Colony and Natal) has for some years been traversed by a magnificent system of geodetic triangulation of the very highest value (the only true *geodetic* triangulation in Africa), none of the colonial surveys have been either based on it or adjusted to it. At present it stands alone as an abstract scientific enterprise, with no practical or utilitarian outcome whatever. And the result is that when the great accumulation of colonial estate maps were patched together in order to compile a practical military map, it was found that (possessing no general basis of triangulation) there were internal discrepancies which absolutely invalidated the map for military purposes. Such a combined patchwork of local surveys is of little or no value as a general map of the country even for ordinary civil and administrative purposes. For instance, it would be unadvisable to depend on it for the allignment of a railway or a boundary. Very considerable expense and delay must be incurred before a really satisfactory map (even on a small scale) could be constructed out of such material. The Government surveys in the protectorates, in the Transvaal, and in Egypt (equally independent of a geodetic basis) are conducted on the more or less regular lines of preliminary triangulation and subsequent topography, and they should not only be effective first maps of the

country they represent locally, but they should be readily adjustable (without appreciable error) to the final framework which is to give each local series its true geographical position as soon as that framework is ready. These surveys would be officially classed as topographical, but the map results must often approximate to that which we now define as "geographical" when no rigid rule of technical procedure can be followed. Triangulation may sometimes be an impossibility (as it usually is in West Africa), in which case elaborate topography is out of place, detail is scanty, and the process of surveying becomes a process of exploration with a small-scale map as the result. Such work can only rank as geographical surveying, and it may be pretty safely assumed that very large areas indeed of the African continent are suited to this form of work only. But geographical survey should be by no means limited to those areas which are unsuited to a more elaborate system. On the contrary, it would be well if geographical survey were to precede all other forms of survey everywhere. For a vast proportion of the continent of Africa (as of Asia) it will inevitably be found that nothing better will ever be needed; and even for that which is destined hereafter to develop under British rule into a full measure of civilized prosperity, the process of development will be greatly accelerated by the assistance of a good general geographical knowledge of the country beforehand. There is no necessity to enter into details of what constitutes geographical surveying. A most excellent book on surveying has recently been published in America, wherein "Exploratory" and "Geographic" surveys are treated for the first time as distinct branches of the general art of topography.* The main points to note are, (1) that geographical surveying depends as much on sound triangulation (or its equivalent), and demands as much attention to accuracy, as any other form of survey; (2) that it can be made to fit with certainty into its right position (as co-ordinated in latitude and longitude) whenever that position is determined by geodetic measurement; (3) that it is exceedingly rapid in its development and comparatively cheap. All those surveys in Africa which have been carried out for boundary purposes, as well as those military surveys which, under Major Jackson, Captain Close, and Mr. Casgrain, have already spread over a great part of the Transvaal, rank as geographical surveys in so far as they have been conducted for the production of maps on a small scale for illustration of the features of the country as a whole, and not for purposes of local defence, etc. Hundreds of thousands of square miles of territory on the Indian borderland have been surveyed on geographical scales by methods which, whilst they follow

* 'Topographic Surveying, including Geographic, Exploratory, and Military Surveying.' By H. M. Wilson. John Wiley & Sons, New York, and Chapman & Hall, London. See also list of works bearing on the subject of geographical surveying at the end of this article.

the recognized system for topographical surveying which is common to all countries so far as is practicable, do not pretend to adhere to any rigid form of procedure where the recognized systems are impracticable. In days that have hardly yet passed by, opportunities which are now utilized for a geographical survey would have resulted in a thin line of traverse flanked by wide blank spaces where no feature was delineated, although much of the physiography of the country must have been within easy range of vision. The difference between these efforts on the part of early explorers and the infinitely more comprehensive illustration of the topography of a country which is now demanded, is due partly to the immense improvement in the graduation of the smaller classes of instruments, but chiefly it is undoubtedly due to the thorough knowledge which is now acquired of the capabilities of the plane-table by well-trained topographers. Instead of the thin red line of traverse, we demand square maps showing every topographical detail which is appreciable on the scale of survey; and we further demand that hundreds of square miles of mapping should be turned out where ten sufficed before; and that all of it should be so fitted within certain well-fixed points that we can determine with certainty the co-ordinate position in latitude and longitude of every feature of the map to a degree of exactness that betrays no error on the small scale of the mapping, when the mapping is tested by the rigorous methods of final geodetic, or first-class, triangulation. This is what we call geographical surveying, and it is a class of surveying which is but half appreciated in England, because in England there is no opportunity for its practice or illustration. It is, however, well understood in America, Russia, Germany, and France, and it has been invaluable to India. Geographical surveying should specially appeal to the members of the Royal Geographical Society, for it places an agency within the reach of every member of the Society which may result in most useful additions to the sum of our geographical knowledge, not only in Africa, but wherever that knowledge is weak. So far as Government surveys are concerned, the R.G.S. can hardly offer any assistance which promises to be practically useful. It can at most but represent the opinion of an influential body of geographers in favour of any method which will ensure unity of scale and homogeneity in the final map-results. But in the broad realm of geographical exploration there is ample room —room, indeed, so ample that it seems hopeless to expect that it will be adequately filled for many years to come—for those expeditions, conducted either in commercial interests or for the simple sake of adventure, which, extending far beyond the region of settled administration and regulation survey processes, might result in the acquisition of geographical map information quite good enough to take its place in line with the permanent map records of Government. It has been so in Asia, and it may be so in Africa. If every independent

explorer would work intelligently on certain fixed methods, there would gradually be amassed so great a store of information of permanent geographical value that we should soon be in a position to deal with topographical certainties in arranging boundary demarcations or in projecting the general economic developments of the country.

I have already said that the fundamental support of good geographical work is a thorough knowledge of the capabilities of that most useful instrument the plane-table. I may now add that, in order to obtain that thorough knowledge, years of experience, united to a special talent and unusual powers of observation, are necessary. The process of the evolution of a firstrate topographer is a process of selection in the first instance, and of careful training afterwards. It is not a course of training for a few months at a military or geographical school that will result in the acquisition of the trained hand and eye of the artist, united to that topographical instinct which teaches a man to identify the features of a varied landscape from every point of view, even when we have secured the physique, the powers of adaptation to unequal circumstances, the endurance, the patience, the tact, and the indomitable perseverance which distinguish the best topographers. Technical training must be allied to practical experience, and it would be as absurd to expect a man to be a good topographer because he knows the theoretical use of the plane-table, as that he should become a good shot because he knows the use of a gun. Yet, judging from the composition of some of the survey parties at work in Africa, this is exactly what is expected. Obviously, therefore, we cannot ask the promoter and organizer of an expedition—the man who has to bear the weight and responsibility of leadership, who has his time most fully occupied in arranging details of the daily march, and his mind full of many other important interests than those which concern the geography of his surroundings—to undertake such an all-absorbing and (at times) perplexing duty as that which is involved in the actual mapping of the scene of action. The most we can ask is that he should supply himself with all the necessary data at starting on which to base his work, and that he should know enough about surveying to carry out the preliminary triangulation, and make the necessary astronomical observations; that he should, in short, be sufficiently well trained himself to keep a trained topographer straight, checking his work, and supplying him with points to work upon—and this indeed is a good deal to ask. It is by the association of a *trained professional* topographer with exploratory expeditions in Tibet, in China, on the Burmese frontier, and in Persia that we have acquired the best part of our map knowledge of those countries. It is a knowledge which will doubtless in time be superseded by more regular and systematic surveys than those which have hitherto been possible over those areas which promise to repay closer examination, but over other

and far larger spaces it is probable all that will be practically wanted for many decades to come. It is, at any rate, sufficient to indicate in what directions such closer examination is desirable, and consequently it is of infinite practical value. But for Africa, where are we to get the trained topographers who must eventually furnish the grit and backbone of African mapping as they have furnished it in India and beyond the borders of India? There is no topographical staff in England as there is in Russia or America or India, and there is no opportunity within the restricted area of Great Britain for the training of such a staff. How are we to get the men we want? It is true that very great advance has been made in late years towards the training of officers. There is a most excellent school at the Royal Engineers' headquarters at Chatham (organized and superintended by Major MacDonnell), which has at any rate led to a far wider and more comprehensive grasp of the whole subject of military map-making by our military authorities than ever existed before; and there is a training class connected with the Royal Geographical Society which has been working towards the same end for years. But it cannot be too often repeated that the limited and restricted practical instruction which is all that is possible in England can *never* turn out topographers such as may be found in numbers in the field of geological survey in Canada or the United States, or on the borders of Russia (wherever she extends those borders), or on the wide extended frontiers of India from Persia to Burma. Neither can Africa draw on India to any great extent for assistance. The requirements of India are sufficient to occupy her whole staff, even if financially it were possible to burden India with the cost of training men for foreign service. It is, moreover, doubtful how far the native of India would be successful in dealing with the native of Africa. Much of the success of the Indian system is due to the practice of training natives of all nationalities for the special object of working within the limits of their own countries. So far as Indian natives have been employed in Africa, the experiment has been distinctly successful, and the record of their work on the part of administrators has been invariably favourable. But they have not been utilized much for purposes of exploration, and it is on this capacity that their assistance now is so urgently needed. The most that can be expected from India is the advantage of the Indian training school for purposes of instruction. In this direction (and in one other which will be noted presently) it is possible that India may extend a helping hand to Africa to some practical purpose.

There are two distinct classes of topographers needed in Africa, viz. European and native, and it must, I think, be recognized as a necessity that the practical training-ground for both should be Africa itself. Already the Transvaal and the Orange River colony have afforded our military surveyors the opportunity for, at least, a partial training in

topography of a section of Royal Engineers drafted out to South Africa for that purpose. The work that has been done for military purposes is, for the most part, of that nature which we now class as geographical, and it will furnish a very fair sample of what may be expected from such an agency in future. If successful, it is much to be hoped that here is the foundation of a trained corps of military topographers who will hereafter be fully as usefully employed in times of peace as in times of war. The process of training has, at any rate, been in most capable hands. The experiment must result in really trustworthy indications. There are, again, a number of men already employed in African fields who have been trained in various schools (some of them hold the R.G.S. diploma), none of whom could possibly rank originally as trained topographers, but amongst whom there must be some who have gradually, by force of circumstances, acquired a considerable practical knowledge of the art. And there is yet again another source of supply which is not as fully known as it should be. The Government of India has decided that after the age of fifty-five no man is to be officially considered capable of undertaking further civil work which is not of an administrative character; so that year by year a certain number of men are dismissed from the Indian Survey Department, on pensions, who are not only capable, but most willing, to take the field for another five or ten years. Amongst them are some of the most experienced surveyors and best instructors that India has produced, and none could be more technically efficient than they to undertake the superintendence of African surveys and the training of topographers, provided that they can (at their age) fit themselves to the new field and the requirements of African administration. Here the Royal Geographical Society may usefully extend a helping hand. It is proposed to keep a register of the names of all such men at the Society's office (along with a general record of the names of all men whom the Society can confidently recommend in connection with their own school), and to circulate that register from time to time amongst those offices which have to do with the organization of surveys in Africa or elsewhere in the colonies. That is to say, that the Society may undertake to introduce the "supply" to the "demand," but will of course go no further than the introduction.

On the whole the prospect of gradually raising an efficient staff of European workmen in the field of topography appears to be by no means a hopeless one. But for one European who takes the field in India, there are at least four or five natives. Economy, no less than efficiency, makes it a *sine quâ non* that most of the exploring work in trans-border countries should be carried out by natives of the country; in fact, India could never do without them. No solid reason has ever yet been adduced against a similar employment of trained natives in Africa. It will certainly take some years before any experiment in this direction can be satisfactorily concluded, because it will take time in

the first instance to select likely pupils (although the sources from which they may be drawn are as infinitely varied in Africa as they are in Asia), and still more time to train them; but the broad assertion that there are no natives of Africa who will exhibit the same peculiar aptitude for geographical map-making which is so marked a feature in natives of all castes and nationalities in India, is hardly to be accepted until the experiment is tried.* But it must be remembered that the experiment, to be satisfactory, must be on a considerable scale and thoroughly complete. It is not every native of India who possesses the idiosyncracies of an explorer, and a special aptitude for topography. On the contrary, the process of selection is one demanding infinite resources of time and patience. One great success is assuredly balanced by at least twenty failures; but then, the one success is well worth all the time and patience bestowed on those twenty failures. We can but hope that the settlement of South Africa will lead to a full and careful consideration of the best means to procure that great desideratum — a thoroughly accurate and homogeneous geographical map of all our African possessions; and that the training of a staff of native topographers will be admitted as one of the means to the end in view. Whether they are trained in a central topographical school analogous to that at Dehra in India, which is, I understand, already contemplated; or whether the experiment is made by the formation of a topographical party for the special object of geographical exploration, seems to be a matter of detail of no great importance. Both methods have been found to work efficiently. What is wanted eventually (say in four or five years' time) is a capable and extensive staff of topographers for Africa, both European and native, on which explorers, whether they are Government officials or bound on private enterprise, may indent (as they indent in India) for that assistance in the technical details of map-making which it is quite impossible that any but a fully trained topographer can give. With that assistance every geographical society in Great Britain could lend a useful hand towards the evolution of the map of Africa.

List of Publications bearing on Geographical Surveying.

'Handbook of Professional Instructions for the Topographical Branch Survey of India Department.' Prepared by Lieut.-Col. St. G. C. Gore, R.E. Published in Calcutta.

'Aid to Survey Practice.' By L. D'A. Jackson, A.M.I.C.E. London, 1889.

R.G.S. 'Hints to Travellers.' Woodthorpe's article on plane-tabling.

Professional Papers Royal Engineers (Occasional Paper Series), vol. xiii. paper v. by Holdich; vol. xiv. paper ii. by Talbot; vol. xxvi. paper i. by MacDonnell. R.E. Institute, Chatham.

* To a certain extent it has already been tried. A large area of most useful geographical mapping in West Africa has been contributed to geography by a native of Africa—Mr. Fergusson.

LHASA.

By Colonel Sir T. H. HOLDICH, K.C.I.E., C.B.

Two very interesting photographs have been added to the collection of the Royal Geographical Society, illustrating the city of Lhasa and Potala, the residence of the Dalai Lama, in its immediate neighbourhood. These photographs derive additional interest from the fact that in the October number of *La Géographie* (the journal of the Paris Geographical Society) is to be found the reproduction of a photograph of Potala taken during the present year by a Russian subject—a Kalmuk chief named Ovché Novzounof—which is said to be the first photograph ever taken of the holy city. The date of the photographs herewith published (p. 607) is not precisely known, but there is good reason to believe that it was considerably anterior to that of the Kalmuk traveller. The point of view of Potala is almost identical in both cases, and nearly coincides with that of the early picture of "Bietala," made by the Jesuit fathers about the year 1660 (p. 605), which has hitherto been the only pictorial record of the place.

Potala is the most important architectural feature about Lhasa, and it is described by every traveller who has visited it during the nineteenth century. Manning was there in disguise in 1811; and the French missionaries, Huc and Gabet, resided several months in Lhasa in 1846. Since then no European has set his foot within the gates of the city, but many native travellers have been there, and have brought back records which are sufficient to give us a fairly clear idea of the city and its environment. An Indian Survey explorer, Pundit Nain Sing, made two journeys to Lhasa in 1866 and 1873; and he was followed by a second explorer (A. K., or Krishna) in 1879–80. A member of the Indian Educational Department, Chandra Das, accompanied by a survey explorer, the lama Ugyen, travelled to Lhasa in 1881–82, and to him we owe the most comprehensive and detailed accounts of the city and its people that have yet been produced. In all important particulars they support the earlier records of Nain Sing and Krishna. The latter made a map of Lhasa, which is reproduced from the *Petermanns Mitteilungen* (1885) in the October number of *La Géographie*. These Indian explorers have been succeeded more recently by Russian subjects, Kalmaks and Buddhist priests, amongst whom one Baza-Bakchi is quoted as an authority in the French journal.

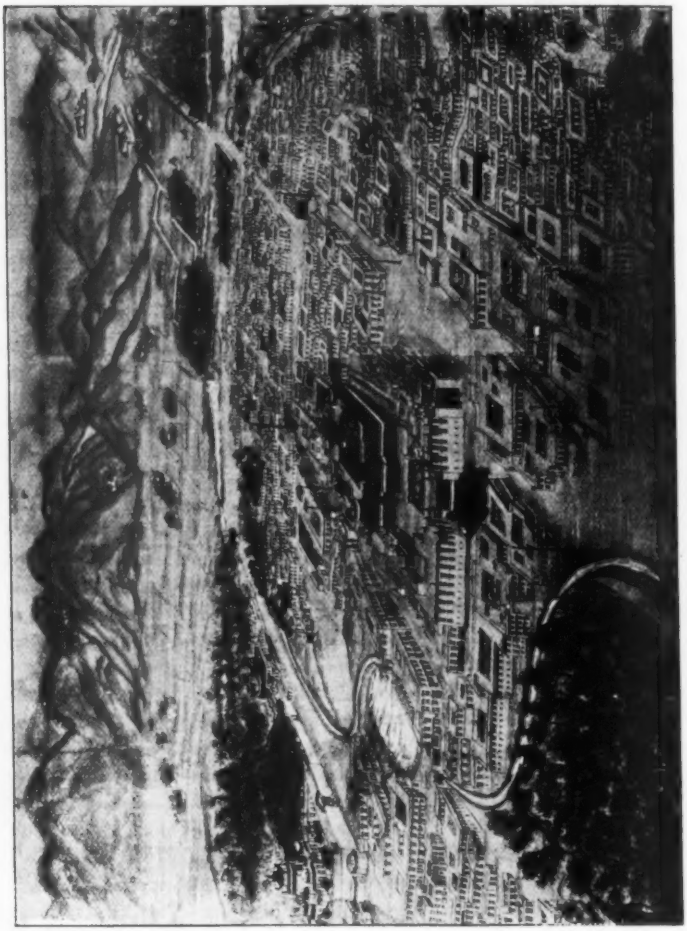
According to Baza-Bakchi, the hill on which the Potala palace and temple stand is 500 metres in height above the plain. This is obviously impossible, for (on the evidence of the photograph) it would make the walls of the building nearly 200 metres (over 700 feet) in height Krishna's estimate of 300 feet is probably much more nearly correct;

and even that gives an impressive idea of the stupendous nature of the construction which crowns the hill. It is difficult to reconcile the earlier Jesuit drawing of the temple and hill with the modern photograph. It

would almost appear that the buildings had undergone considerable extension during the two and a half centuries which have elapsed between the illustrations. It is probable enough that this has been the case; but too much reliance on the details of the architectural drawing

is hardly warranted by the accessories of the picture, amongst which we find a two-wheeled conveyance of the nature of the Indian ekka drawn by a pair of horses!

According to Chandra Das, who entered Potala by the eastern gate-



PLAN OF THE CITY OF LHASA.

way on his visit to the Dalai Lama, he first "walked through a long hall, on either side of which were rows of prayer-wheels, which every passer-by put in motion. Then ascending three long lines of stone steps, we . . . proceeded towards the palace. . . . We had to climb up five ladders before we reached the ground-floor of Phodang marpo, or

'the Red Palace,' thus called from the exterior walls being of a dark red colour. Then we had half a dozen more ladders to climb up, and we found ourselves at the top of Potala (there are nine storeys to this building), where we saw a number of monks awaiting an audience." Nine storeys of, say, 20 feet would account for 180 feet of altitude within the building itself, which obviously extends above the hill as well as down its upper slopes, so that an estimate of 300 feet for the

POTALA, THE PALACE OF THE GRAND LAMA.
(*From Kircher's "China,"* 1667.)

actual height of the hill seems to be fairly well supported by the photographs.

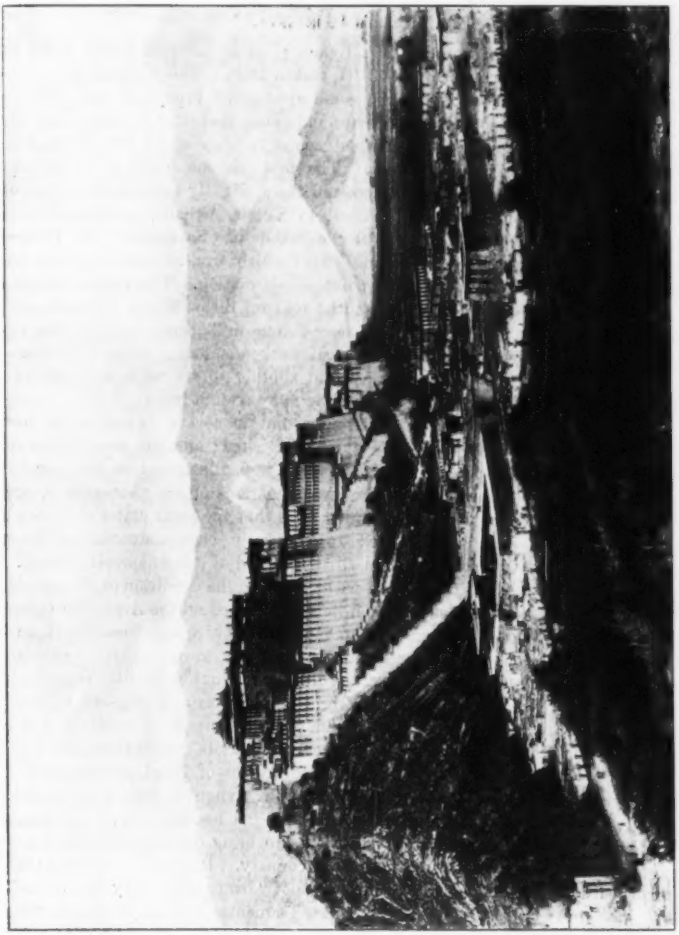
Potala derives its chief interest from the fact that it is the residence of the head of all the great Budhist hierarchy, the Dalai (or Tale) lama, who is represented in the flesh by a child of tender years. In 1811 Manning describes the Grand Lama as a well-educated, princely child about seven years old. In 1846 Huc says that the Dalai Lama was nine years of age, and had been Grand Lama for only six years. In 1866 Nain Sing describes him as a fair and handsome boy of thirteen years of age, entirely dominated by the Gyalpo or temporal ruler of Lhasa. Thus one re-incarnation at least must have taken place between

the visits of these two later travellers, and probably more than one, for, as Montgomerie shrewdly observes, "Grand Lamas are made to go through their transmigrations very rapidly, the intervals being probably in inverse proportion to the amount of trouble they give to the Gyalpo." Chandra Das (our latest authority) writes of the Dalai lama as "a child of eight with a bright and fair complexion and rosy cheeks. His eyes are large and penetrating, the shape of his face remarkably Aryan, though somewhat marred by the obliquity of his eyes. The thinness of his person was probably due to the fatigue of court ceremonies and to the religious duties and ascetic observances of his estate. A yellow mitre covered his head, and its pendant lappels hid his ears; a yellow mantle draped his person, and he sat cross-legged with joined palms." Certain it is that the Dalai lamas of Tibet are invariably children, and that they die as those die "whom the gods love."

The plan on p. 604 appears to be taken from a drawing of the city of Lhasa by a native artist; and there is some appearance of the drawing itself having been made from a photograph as the original. It is not very easy to locate the point of view. The only indication which can be followed is the stream, or canal, which winds through the picture, touching the city walls at two points. According to Krishna's plan, such a feature can only be observed from a point (evidently elevated) north of the eastern end of the city, so that the observer is looking towards the valley of Kyichu, and to the roads leading southwards through the mountains towards India.

If this is so, then the building with the dark-red walls in the centre of the city is evidently the Jo (Nain Sing) or Jo Khang (Chandra Das), the great temple of Jo-vo, or "the Lord Budha," whose famous image, known as the Jo-vo-rinpoche, is said to have been made in Magadha during the lifetime of the great teacher. Here men, women, and children congregate to do worship and to obtain a blessing on June 1, reckoned to be the holiest day in the year as the date of Budha's nirvana. An interesting legend connected with this image is told by Chandra Das in his 'Journey to Lhasa and Central Tibet.' The picture well illustrates the nature of Tibetan homes—"tower-like whitewashed houses and Chinese buildings with roofs of blue tiles" all stone-built and substantial, with a central courtyard. The windows are seldom glazed, paper usually taking the place of glass. A decorative feature of Lhasa is found in the festoons of inscribed and painted rags which are hung from one building to another, and in the banners which line the approaches to some of the principal temples. They may be seen in the Potala photograph, where their motion as they sway with the wind rather mars the effect of the picture. It is hardly necessary to point out that the flag-poles in the native artist's picture are enormously exaggerated in length. About the size of the city (which

is oval in shape, with the longer axis from east to west), there is little apparent difference of opinion. It is 6 or 7 miles in circumference,



POTALA, THE PALACE OF THE GRAND LAMA.
(From a photograph by a member of the Nepal Embassy to Peking.)

and contains a population variously estimated from 25,000 to 50,000 souls.

REVIEWS.

ASIA.

Mr. Lynch's 'Armenia.'*

In two large well-printed volumes, Mr. Lynch gives an account of his visits to Russian and Turkish Armenia in 1893–94, and in 1898. The volumes are illustrated by 197 excellent reproductions, some apparently French, of the author's sketches and photographs; by special maps and plans, made in Germany; and by a general map of Armenia and the adjacent country, compiled by Mr. Shawe, and published also separately by Stanford. The first volume deals with Russian Armenia, and contains a minute and, here and there, slightly tedious description of the route followed from Batum on the coast to Kutais, Akhaltsyk, Alexandropol, Erivan, Ararat—which was successfully climbed on September 19, 1893—Edgmiatsin, Ani, Kars, Kagyzman, and the Turkish frontier; accompanied by geographical, historical, statistical, and political information. The second volume carries on the route from the Turkish frontier to Van, Bitlis, Mush, Erzerum, and Trebizond; and gives the details of the second tour in Turkish Armenia, during which much good topographical and geological work was done. In each volume a chapter is specially devoted to geography, and another to statistics and politics; and in the second there is a very useful bibliography and an index.

Mr. Lynch followed no untravelled routes, but in several instances he has added to our knowledge of the districts which he visited; and his descriptions of Akhlat, Nimrud Dagh, Sipan Dagh, and Bingöl Dagh, illustrated as they are by maps compiled from his own surveys and reproductions of his photographs, are both interesting and valuable. It is the first time that the great crater of Nimrud Dagh, nearly 5 miles in diameter and 14½ miles in circumference, has been thoroughly examined and described, and all that is said of it is of special interest.

The volumes give much information with regard to the condition of the people, and to the vast tracts of fertile land which lie uncultivated on the Armenian table-lands. Mr. Lynch finds little to admire in the methods of government in Russia and Turkey, or in the policy adopted by those states towards their Armenian subjects. He writes enthusiastically of the Armenians, but apparently regards all Kurds, whether of Kurdish or Armenian origin, as parasites and long-beaked birds of prey. This is not the place to dwell upon the rival merits of Armenians and Kurds, or upon the fascinating history of the land and its people from the time when Tiglath Pileser I. defeated the confederate princes of Nairi on the plain of Melazkert to the present day. To that history Mr. Lynch scarcely does justice. He has given a good account of the Vannic empire, and has dealt with the kings of Ani; but a more continuous history is needed to bring out the various causes which have led to the present condition of the country. It may be observed that the mediæval kingdom of Lesser Armenia was not "overwhelmed by the Turks" (i. 367), but by the Sultan of Egypt; that Tsamentav, which is placed near Amasia (p. 364), and in the Cilician Taurus (p. 395), has been identified with Azizieh, on the Zamanti Su, eastward of Kaisarieh; and that the great battle in which the Seljuk Sultan of Rum defeated the Kharezmians was fought near Erzingan, and not at Akhlat (ii. 296). In writing of Lake Van, it is remarked that "the most obvious explanation of this gradual rise in the norm of the lake-level is furnished by a cause which must be constantly operative, namely, the increase of sediment deposited upon the bottom" (ii. 52). The rise due to this

* 'Armenia: Travels and Studies.' By H. F. B. Lynch. 2 vols. Longmans, 1901.

cause must be extremely slow, and it would be safer to attribute the fluctuations of level to alternate periods of excess or deficiency in the snow- and rain-falls.

Mr. Lynch's book is full of information, but from a geographical point of view, it is somewhat disappointing. In the descriptions of scenery there is occasionally such a flow of words that the reader is apt to be wearied and lose the impression which the writer intends to convey. And in the two chapters specially devoted to geography, which are based on the researches and theories of Abich, Naumann, Suess, and the author, close reading is sometimes required to grasp the meaning. The series of really beautiful photographs, illustrative of the scenery, the monuments, and the people, which are reproduced with much artistic taste and technical skill, are valuable additions to a work which is something more than a mere record of travel. C. W. W.

Earl Percy's 'Asiatic Turkey.'*

Lord Percy, who has travelled in Asiatic Turkey on two previous occasions, here describes a visit to the wild Alpine district near the Persian frontier, which Chaldean and Kurd intrigues and forays keep in a perpetual state of turmoil. From Konia, which was reached by rail, the author's route lay through Nigdeh, Kaisariyeh, Geuksun, Kharput, and Mush to Bitlis, crossing Anti-Taurus, and crossing and re-crossing the Taurus range. From Bitlis the Chukh Dagh was crossed to Kochanes, and the journey was continued by Julamerk, the Jelu Dagh, Diza, Neri, and Rowandiz to Altun Keupri, where a raft was constructed for the sail down the Lesser Zab and the Tigris to Baghdad.

Readers of the author's interesting and suggestive 'Notes from a Diary in Asiatic Turkey,' will find the present volume equally attractive and deserving of attention. The vivid pictures of daily life amongst the hardy mountaineers who dwell on the mountain slopes and in the deeply cut valleys of the Alps of Hakkiari, throw much additional light on the religious and political differences which convulse the district, and illustrate, as it were, the more reserved language of the official reports. The work should be studied by every politician who wishes to understand the relations between Turk, Kurd, and Christian in a district which at any moment may give birth to political questions of grave importance. To the geographer its value lies in the clearly worded topographical remarks on the various localities visited during the long journey eastward, and especially in the descriptions of the grand scenery of the truly Alpine district, of which the Jelu Dagh is approximately the centre. The illustrations of scenery, etc., reproduced with great technical skill from excellent photographs, are as beautiful and remarkable as those in the larger work of Mr. Lynch. It is to be regretted that the author has not always adhered to the R.G.S. system of spelling place-names. In some instances the French *dj* and *ou* have been used instead of the simple *j* and *u*; and there are uncorrected printer's errors, such as Meviana for Mevlana, Zu for Su, Adaya for Adalia. On p. 24 Isnik Geul is clearly an error for Sabanja Geul, as the railway does not run near the former. C. W. W.

Dr. McCrindle's 'Ancient India.'†

The comparatively small world of Indian antiquarian scholars, no less than the larger world of intelligent travellers, owe a debt of gratitude to Mr. McCrindle for having placed within easy reach of them a compact and handy series of references

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* 'Highlands of Asiatic Turkey.' By Earl Percy, M.P. 1 vol. E. Arnold, 1901.

† 'Ancient India.' J. W. McCrindle, M.A., LL.D. A. Constable & Co., Westminster.

to those classical authorities whose writings deal with Ancient India. The boo before us is the last of the series. After dealing with the Indika of Ktesias, the Indika of Megasthenes and Arrian, the commerce and navigation of the Erythræan sea, Ptolemy's Indian geography, and the invasion of Alexander the Great, McCrindle whips in the series, as it were, with a volume which deals with Herodotus, Strabo, Pliny, and some dozen minor authorities—all under one cover. The book is consequently heavier and not quite so handy as its predecessors in the series, of which the adaptability of each separate volume to the capacity of an ordinary pocket, and its small consideration as an additional weight to a traveller's baggage, were by no means a contemptible attribute. The value of the series lies hardly more in the accuracy of translation and the scholarship exhibited by its author than in its ready accessibility to those political, military, and commercial wanderers whose business leads them into the remoter corners of our Indian Empire, and who can verify for themselves, as they go, the extraordinary accuracy of some, at least, of those old-world records of the changeless East. It is with the help of such practical scholars as McCrindle that the unwritten history of a country which has never produced a historian can be gradually unfolded by men whose knowledge of Greek literature probably ends with the Greek version of the New Testament; and the worst criticism which can be passed on this latest volume is that the author appears to be unconscious of the extent of the fresh information about ancient India which has been evolved with the assistance of those parts of the series which have preceded it. For more than a thousand years the world was indebted to classical authors for all that was known about India. When classical authors failed, the Chinese Buddhist pilgrims stepped in, and they were followed in turn by those medical Arab geographers (travellers, compilers, and plagiarists), who have left more record of outer India than of the actual peninsula. But never a Brahman philosopher, or Buddhist saint, has troubled his meditations by the sordid consideration of the passing story of the Eastern world; of the rise and fall of dynasties, or the great movement of its peoples; and if his geographical instincts were aroused at all, it was only by the necessity of seating his best and most potent god on the highest pinnacle of the remotest hills. Classical authority, both for the history and geography of India, commences with Herodotus about 450 years B.C. According to McCrindle, Herodotus possessed but "a vague and meagre knowledge of India," and consequently only three or four pages are devoted to a reproduction of some of his tales (including the famous story of the gold-digging ants), and giving us none of his historical or geographical indications. As a matter of fact, it is to Herodotus that we owe an account of the nations which in his time occupied the ancient Persian Empire, and it is remarkable that, of the nations mentioned by him as existing in Ariana (Afghanistan) and Baluchistan, almost every one is represented to-day by a so-called Afghan or Baluch tribe, under almost the same name and often in the same situation as those assigned by him. The assistance thus afforded to ethnographical inquiry has been most valuable, and indirectly the contribution to our knowledge of the ancient geography of the Indian borderland is hardly less so. Through the writings of Herodotus, we are able to appreciate the wide extent of those early Greek colonies that were spread through Central Asia (partly by the process of bodily transportation, and partly by voluntary exile) centuries before the Macedonian invasion of India. Indeed, it may fairly well be doubted whether any modern British official possesses a clearer idea of the ethnographical and geographical affinities of the nations and tribes inhabiting Asia between Syria and Indo-China at the present time, than that which was possessed by Herodotus four centuries and a half before Christ. Such knowledge, although it bears but indirectly upon India, hardly deserves to be

called "vague and meagre." Strabo and Pliny are treated with more liberality, and the book contains not only copious extracts from their works, but many valuable notes illustrating the text of them. But there are, now and then, indications that the author is not fully acquainted with the results of such inquiries as have been made, during the progress of recent surveys in Afghanistan and Baluchistan, into the antiquarian records of those countries. This is probably due to the official "confidential system" of preserving records. It is unnecessary, for instance, to quote Bunbury (p. 87) to the effect that the direct route between Herat and Kabul has "not been described in detail or traversed by any modern traveller." It was not only traversed, but surveyed by the officers of the Russo-Afghan Boundary Commission no less than fifteen years ago. Information to this extent at least is public property, although the records of that commission have been labelled "confidential" for a most unnecessary length of time. Nor can we admit any longer that Bampur represents the ancient capital of Gadrosia, seeing that the site of that ancient capital has been identified, and may be recognized under its ancient name considerably to the east of Bampur, and is so placed in the most recent survey maps. Such small items for criticism as these in a book so full of information, however, merely indicate its value as a whole. McCrindle's series has probably done more to awaken a general interest in the antiquarian records of the most interesting part of Asia than any work which has hitherto appeared. It should not only have its place in every geographical library, but part of it, at any rate, should be a familiar addition to the personal equipment of the Indian frontier official; for it is on the frontier chiefly that the light of antiquity is required to assist in unravelling the ethnographical problems of the present. An entire revision of our map knowledge of ancient India is one of the requirements of the age, and to this, again, the study of McCrindle's translations is almost a necessary introduction. T. H. H.

Merzbacher's 'Caucasus.'*

Herr Merzbacher's two very substantial volumes comprise a detailed account of the journeys of a mountaineer in the Central and Eastern Caucasus (that is, in the regions between Elbruz and the Dariel, and between that pass and the Caspian), and an abstract of the information the author has, with the most praiseworthy energy and perseverance, collected from the many literary sources available in Russian or European literature. In the first volume, which deals with the Central Caucasus, he has been anticipated to a certain extent by the papers and volumes of our own Alpine Clubmen, and the English reader will find himself among familiar names and scenes where comparatively little is altogether new to him. The German traveller and his companion, the late Herr Purtscheller, made, however, several new ascents and visited one or two valleys which had not been described by Mr. D. Freshfield and his comrades. He has collected and collated from Russian sources a variety of fresh details with respect to the mountain tribes. In the matter of mountain nomenclature and altitudes, he has been at great pains to revise the work of his predecessors. With regard to matters of nomenclature, Herr Merzbacher might perhaps have done well to give more weight to the following considerations. Individual summits not conspicuous from a valley have, as a rule, no distinctive names apart from the ridge to which they belong, while peaks prominent from the valleys have often as many names as there are valleys from which they are visible. When one of these names has been adopted in literature or in a

* 'Aus den Hochregionen des Kaukasus.' Wanderungen, Erlebnisse, Beobachtungen, von Gottfried Merzbacher. 2 vols. Leipzig: Duncker und Humblot. 1901.

Government Survey, it cannot be altered without serious inconvenience, and later travellers should, therefore, be very chary of meddling with the nomenclature of their predecessors, even when they see what they may consider good grounds for a change. With regard to heights in the Caucasus, the ultimate authority is, of course, the Government Survey, but this has not yet been definitely issued to the public, and since the advance sheets courteously communicated to mountaineers are not always consistent, it seems premature to assert that a final determination has been arrived at in all cases. There is no doubt, however, that if Herr Merzbacher is likely in his turn to fall under the revision of his successors, his own corrections are often just.

The main interest of the work for English readers lies in the full and graphic description of the highlands lying in a triangle, of which the apex is Vladikafkaz and the base the Caspian sea, to which the general name of Daghestan—the mountain country—has been given. It would, we believe, be well worth while to translate this second volume into English. It furnishes the reader not only with the adventures of a mountaineer, but with a very complete and lively description of the physical characteristics of the region explored by the author. It describes in detail lofty ice-clad ridges and rugged glens lying outside the usual tracks of local traffic, and but feebly delineated even in the latest survey. It pictures in their own homes the brave mountain people who for so many years maintained their independence against the available forces of the Russian Empire, and who now furnish some of the best soldiers and generals to the Russian army.

The map and illustrations call for particular notice. The former, in three sheets, is in the main a reduction from the last Russian survey, and Herr Merzbacher has carefully evaded going beyond its available sheets (*e.g.* in the case of the Laila range south of Suanetia). He has probably introduced some corrections, but he has not adopted those made in Mr. Freshfield's map of the Central Caucasus, which have been proved to be accurate in several instances by recent explorers. Apart from such questions of detail, Herr Merzbacher deserves the thanks of all geographers for having placed at their disposal the first authentic physical map of the snowy groups of Daghestan.

The illustrations are numerous, and on the whole successful. Some may think that what they gain in picturesqueness, from having passed through the hands of an artist, is lost in the accuracy of detail, which only an untouched photograph can supply.

The work as a whole is most creditable to its author and publishers. Neither time nor trouble has been spared to make it as complete as possible in every respect, without any consideration for the preferences of "irresponsible indolent reviewers" or "circulating library" readers. Perhaps they do not exist in Germany! For the serious reader and the scientific mountaineer, Herr Merzbacher's two thousand pages are a perfect storehouse of information, given in a lively style, and pleasantly interspersed with personal adventure. An admirable index lightens the labour of consulting them.

AMERICA.

Conway's 'Bolivian Andes.'*

This valuable and entertaining book of travels, written with *élan* and *esprit*, is a welcome relief from the many dull and superficial volumes which add to the confusion of knowledge regarding South America.†

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* 'The Bolivian Andes.' By Sir Martin Conway. Harper Brothers. 1891.

† For the chief geographical results of the expedition, see *Geographical Journal*, vol. xiv. p. 14.

Sir Martin Conway, accompanied by two Alpine guides, left Southampton July 13, 1898, for La Paz, Bolivia, by the Panama route. Noting the vast accumulations of wreckage of the Panama canal enterprise, he ventures the opinion that the present canal company has made such progress that the "famous Culebra cutting appeared practically finished; . . . it has been excavated to the level of 45 metres above the sea." Engineers will probably not agree with the conclusions which he has drawn from this fact, nor yet, comparing Panama with Nicaragua, that "undoubtedly it would be well to have two canals," there not being sufficient commerce in sight to pay a net profit of two per cent. on one. The author is right about the deadly climate of the isthmus of Panama and its mortuary rival Guayaquil. At the latter place, the writer hereof, in 1881, was shown the statistics of the death rate for a period of many years. "When we have no epidemic, it averages 150 per 1000," said the cadaverous-looking doctor. At Lima, Sir Martin Conway "made haste to see the desiccated body of Pizarro in a glass box." The pious guardians of the remains of the polycephalous conqueror of Peru derived a considerable revenue, from 1868 to 1872, by selling the skull to any innocent traveller for two silver soles. The monotony of steamer life on the west coast, the Oroya railway, the abandoned terraces of Inca times near Lima, the *soroche* sickness in ascending the mountains, the wonderful brightness of the stars, the ride by rail from Mollendo to Puno, on Lake Titicaca, the first sight of the great dome of Sorata, the steamboat voyage on the lake, 12,500 feet above sea-level, the arrival at the "Alto" of La Paz, and the unique appearance of the city, lying in a gigantic gorge 1600 feet below, the view of Illimani, and details of life *en route* to La Paz, are described with the accomplished ease of an old traveller who has got very close to life and its surroundings during numerous voyages.

The author confirms the observations of many explorers regarding the former vast area of Lake Titicaca, which he believes once extended to "27° S. lat.," which would carry it far into the Argentine Republic, despite the fact that the Lipez barrier, 22° 30′ lat., seems clearly to define its ancient southern limit, although, before the uplifting of the Andes to their present level, there is abundant evidence that Lake Titicaca drained southward into the Colorado river of the Argentine Republic, which then flowed into the Atlantic at the present port of Bahia Blanca.

Sir Martin Conway has much to say about the Indian population of the Titicaca tableland and vicinity. He found some of the Aymarás "not unlike the natives in the barren gorges of the Kashmir Himalayas." Speaking of the *fincas*, or country estates in Bolivia: "A *finca* is a social unit. The land belongs to a proprietor, and so in a sense do the Indians dwelling upon it, but the proprietor's ownership is subject to a multitude of rights possessed by the Indians. They cultivate the owner's land, he providing the necessary seed. Each Indian, in return for his labour, yearly receives a certain amount of land for his own use." This sounds very arcadian, but it may be safely said that the yoke fastened to the neck of the Aymará and Quichua Indian by the Spanish Conquistador still remains there. Even the papal bull of Paul III., in 1537, declaring him "a man capable of understanding the faith and the Christian religion," did not greatly lighten his load, and he is still a beast of burden, holding his oppressor in deadly hatred. Hence, when Sir Martin Conway was making an instrumental survey past certain Indian villages, the inhabitants hostilized him and drove him to seek military protection, fearful that even their pantheistic gods were being insulted by the white man. One of Sir Martin's Alpine guides, Maquignaz, hit the nail when he said, "The white folks give employment, and so are the masters."

The author now gives us a fine description of his ascent of Illimani, one of the

monarch domes of the Andes, which he set out to scale on September 5. On the 9th he planted the Union Jack upon the summit, 21,200 feet above sea-level. The few chapters of his book devoted to this notable exploit in alpine climbing are graphically written. While the difficulties encountered were great, and taxed the courage and endurance of the bold traveller, they do not appear to have been so formidable as those encountered upon the slopes of that gigantic sentinel Sorata, which overlooks the cradle of the empire of the Incas on one side, and the interminable forest districts of the Amazon valley on the other. The season selected for Sorata, or Illampu, appears to have been unpropitious; the summit to be reached was the highest, called "Ancohuma." The ascent was commenced on September 20. From a height of about 16,000 feet, "a pair of gulls rose gradually 2000 or 3000 feet into the air; but at their highest, they were far below two condors soaring incredibly high aloft." This is interesting, for the very lofty flight of the condor has been disputed; but from the inter-andean plateau, condors may often be seen on the wing at an elevation probably exceeding 20,000 feet.

Sir Martin Conway, by a strenuous effort, nearly reached the crest of "Ancohuma," but was, at the end of the fourth day, driven back by severe snowstorms, and postponed the final dash for more favourable weather. Later, he again climbed to the altitude of his old camp, 20,000 feet. But Sorata had evidently determined to defeat the gallant explorer and his companions; for many days, the storms had been unusually severe. At the foot of the final peak, the snow was like flour, and by chance had drifted exactly to the side it was necessary to climb. The difficulties increased at every step. "Huge masses of ice overhung in cliffs 100 feet high. Vast crevasses split the face across. . . . No more than 600 feet remained to mount. . . . We came at last to the edge of a great crevasse, perhaps 50 feet wide, that split the whole slope across. It would have been possible to cross this, but we didn't try, for the slope beyond it, leading straight to the top, in perhaps 300 feet, was obviously unsafe in present conditions. It was a little steeper than the slope we had come up, and it was covered with the same powdery snow. . . With bitter regret I gave the word to return. . . . From the mean of eleven different measurements, the height of Ancohuma came out 21,700 feet. My corresponding figures for Illampu are 21,520 feet."

The author's visit to the town of Sorata, on the eastern slope of the great mountain; his chapter on the auriferous wealth of the Tipuani and other parts of the Beni valley; his description of the rubber forests of the same region, which now find an outlet for their products at Mollendo, on the Pacific coast; his visit to the gold-mines of Cusanaco and Yani, near La Paz; his last ride over the *puna* to Orur, where he took passage by railway to Antofagasta, and thence embarked for his homeward journey;—are all interesting chapters containing much useful information. The volume is extensively illustrated with views of mountain scenery, and it brings into geographical prominence a most attractive section of South America.

GEORGE EARL CHURCH.

THE MONTHLY RECORD.

EUROPE.

The First Topographical Survey of Scotland.—Mr. C. G. Cash gives, in the *Scottish Geographical Magazine*, an interesting account of the first topographical survey of Scotland, executed during the last part of the sixteenth and first half of the seventeenth centuries, which, though it has been described before in published

works, is perhaps not widely known among the general public. The first idea of such a survey originated with Timothy Pont, son of a famous reforming clergyman, but of whose life and work little trustworthy information is recorded. In spite of the troublous times in which he lived (he was born soon after 1560) and the many difficulties of travel in those days among the wild inhabitants of the highlands, Pont seems to have carried out the work by his own unaided resources. He, however, died before 1625 without finding a publisher for his survey. His manuscripts might have been destroyed by damp and vermin had not King James learnt of their existence and ordered that they should be duly cared for. The work was next taken up by Sir John Scot, a landed proprietor and politician, born in 1585. He urged King James to have the sheets published, and undertook the superintendence of the work. For the revision and completion of Pont's maps he secured the services of Robert Gordon, a man of some note in the political affairs of his time, and an excellent geographer and cartographer, as is shown by his manuscript work still extant. His work met with countenance from both sides in the civil war, and in order to allow him to continue it unhindered he was exempted from all public burdens, although an appeal to the Parliament was twice necessary to secure the due execution of the warrant. In his work of editing the maps, Robert Gordon was assisted by his son James, who was probably born about 1615, and the preparation of the manuscript maps seems to have been completed about 1648. The eventual publication of the maps by the famous atlas-makers, Blaeu of Amsterdam, was brought about through the constant communication with Dutch scholars kept up by Sir John Scot, who had entrusted to William Blaeu the printing of two volumes of poetry by Scottish writers. Blaeu was considering the possibility of obtaining maps of Scotland for his famous Atlas, and an agreement was therefore arrived at after much correspondence for the publication by him of the maps prepared by Pont and the Gordons, Scot himself going across to Amsterdam to assist in the literary part of the work. The Scottish volume, with some maps of Ireland, was first issued in 1654, when it formed the fifth volume of the whole Atlas. In the final form, first issued in 1662, Scotland formed the sixth volume in a set of eleven or twelve. Mr. Cash gives a detailed account of the maps, of which 46 are detailed topographical maps of districts of Scotland, a river being frequently taken as the topographical unit.

Relief of the Ardennes.—Mr. Henryk Arctowski believes that the plateau of the Ardennes is a plain of marine denudation. He points out that the rivers Lesse, Ourthe, Süre, and Vierre, which radiate from the Serpont monadnock, all suddenly turn, at intervals, at right angles to their normal course, and these bends lie in concentric circles as if the region has been denuded in concentric waves. In the Condroz region the parallel tributaries of the Hoyoux flow mainly in synclines of carboniferous limestone, and erosion has intensified the relief. No faultings explain the course of the Meuse across the Cambrian mass of Rocroi, which is an example of superposed drainage.

The Pre-glacial River-system of Thuringia.—In a paper printed in the *Mitteilungen* for the present year of the Geographical Society of Halle am Saale, and also issued separately in pamphlet form, Dr. E. Wüst endeavours to reconstruct the ancient drainage system of Thuringia from a study of the old river-deposits still traceable. He points out that, as the material brought from the far north during the glaciation of the country has become mingled with all the more recent river-deposits, the presence or absence of northern material may be taken as determining the age of such deposits in general, whether formed before or after the first glaciation of Thuringia. He then describes the position and apparent relations of the chief deposits now existing from which northern rock-material is absent. A

chain of such deposits runs north from the neighbourhood of Mellingen, on the Ilm, crossing the present course of the river and extending as far as Rastenberg on the southern edge of the zone of hills known as the Finne, the deposits occurring at a considerably higher level than the present river valley, but, generally speaking, falling regularly from south to north. This line, which evidently marks a former course of the Ilm, is prolonged across a part of the Finne by the ravine in which the Lossa now flows. North of this the water-parting between the Lossa and the Saubach reaches a height of some 700 feet, which is, therefore, the minimum altitude at which the old river can have flowed. This involves the supposition that a sinking of the strata to the south of the Finne must have been maintained well into Pleistocene times; and this would also account for the subsequent diversion of the Ilm into its present course. In the central basin of Thuringia, Dr. Wüst traces the courses of two main streams, which formed the principal drainage channels in Pleistocene times. The one which had its origin in the western part of the Thuringerwald, entered the central basin near Tonna, traversing the same in a generally north-east direction to the Sachsenburger gate. The other, which was the ancient representative of the Gera, flowed north from the neighbourhood of Erfurt, joining the first a little above the Sachsenburger gate. Unlike the Ilm, the united stream had already reached a level of 500 feet before passing through the Finne, for Dr. Wüst considers it probable that no important earth-movements have here occurred since this epoch, but that the Sachsenburger gate, as well as that of Nebra lower down the Unstrut, already existed in Pleistocene times. This view is borne out by a study of the deposits in the lower Unstrut valley. Still another chain of old river deposits occurs on the north side of the Saale valley between Kösen and Goseck, and from the absence from these of rocks derived from the upper Ilm region, Dr. Wüst concludes that the junction of the Ilm with the Saale took place in former times below the extreme limit of the deposits alluded to.

The Lake Region of Swedish Lapland.—A valuable contribution to our knowledge of the physical geography of this region has been made by Karl Ahlenius, who publishes the results of journeys made in 1899–1900 in the *Bulletin of the Geological Institution of the University of Upsala* (vol. v. part 1, No. 9). The region in question, which extends for at least 350 miles from north-east to south-west, parallel to the main Scandinavian range, had not previously been examined with any thoroughness from a limnological point of view. The writer of the paper alluded to devoted his chief attention to soundings and determinations of temperature in the lakes, the former, which ran to the number of over 1000, being made with rope and lead, and the latter with the reversing thermometer of Negretti and Zambra. The positions of the points of observation were fixed either by counting the strokes in rowing, or by noting the time, when making use of steamers, together with bearings derived from topographic maps. The various lakes are described in order, with full data as to their depths and other characters, the general results of the whole study being afterwards summarized as follows. The chains of lakes all run radially from the mountain mass in the form of so-called fringing lakes, following the north-west—south-east direction of the rivers, and everywhere forming parts of river valleys. Their upper ends are in general branched, as in the case of Hornafvan, Storuman, Wojmsee, etc. The western and north-western portions are narrow and fiord-like, frequently with depths of 350–650 feet. If we place the limit between deep and shallow basins at a depth of 80 feet—about a fourth of the average depth of the deeper lakes—we obtain a deep-water line separating the deep lakes to the west from the shallow lakes or portions of lakes to the east. It is marked in part by the occurrence of lines of islands, and partly by vast masses of shingle or moraine

material. What, it is asked, must be assigned as the cause which has led to this characteristic of the lakes? Dislocation might be adduced, but it can be shown that the deep-water line does not coincide minutely, although it does roughly, with the dividing line between the two main geological formations represented. Difficulties also exist in the way of supposing the fiord-like basins to have been hollowed out by glacial erosion, though both this and dislocation may have had something to do with their formation. It is considered more probable that they were in the main carved out by fluviatile erosion, the river system having apparently presented the same general features as at the present day long before the glacial epoch. The maintenance of the deep basins to the west may be attributed to the conservative action of the ice after its partial retreat, while the country to the east was largely covered by moraine material, the same action possibly also taking effect with respect to the post-archæan formations to the west, and so accounting for the general agreement between the geological and morphological boundaries. From the above, it would seem that many points of analogy exist between the lakes of Lapland and those of the English lake district.

Sarjekfjällen, Northern Sweden.—Mr. Axel Hamberg, who accompanied Prof. Nathorst on his voyage to Spitsbergen, has published in *Ymer* an account, which has also been printed separately, of his investigations in Sarjekfjällen. This district, which lies not far from the Norwegian boundary between the basins of the Stora and Lilla Luleälf, is the most mountainous in Sweden, though its highest point, the Sarjektjäcko, 6858 feet above sea-level, is lower than the Kebnekaise, 7003 feet, in the same range about 35 miles further north, which is the highest summit in Sweden. Mr. Hamberg describes the rocks—granitic, metamorphic, and Silurian—and discusses in great detail the effects of erosion during the Glacial Period and in later times, the present denudation, and the existing glaciers. A proof of the care with which Mr. Hamberg examined the district is the fact that he climbed about fifty summits, varying in height from 5500 to nearly 5900 feet, some of them several times. Sarjek had been ascended before—in 1879 by G. W. Bucht, and in 1881 by Charles Rabot. Many virgin summits still, however, remain to tempt the alpinist.

Changes of the Coast-line of Sweden.—In the *Proceedings* of the Geological Society of Upsala, Mr. Artur Hollender treats of the elevation of the land from an archæological standpoint. He has collected data respecting the localities where implements of the stone age have been found, and regards the line along which these occur in greatest numbers as the ancient coast-line, believing that in ancient times, as at the present day, people settled in greater numbers along the shore, because of the easier means of communication afforded by the sea. This view is confirmed by the fact that further inland, where archæological finds are less rich in the number of implements, the stone axes with shaft-holes are more numerous relatively to those without shaft-holes, whence it may be inferred that man did not penetrate into the interior till a later age. From his data the author has drawn a map showing the coast-line at the time when man first settled in Sweden. It diverges more and more from the present line as it proceeds northwards, and on the whole corresponds to the post-glacial limits of Sweden and Finland.

ASIA.

The Fedchenko Expedition to the Pamirs.—*Globus* (vol. 80, No. 16) quotes from the Turkestan *Viedomosti* details respecting the expedition to the Pamirs under O. A. Fedchenko, the despatch of which was recorded in the *Journal* a few months back. On July 8 (New Style) the expedition left Osh, in Ferghana,

crossing the Kizil Art pass on the 16th, and reaching the Pamirski post, by way of the Kara-kul and the Ak-baital pass, on the 23rd. The further route led by the Alichur Pamir, Lake Yeshil-kul, and the Koj-tesek pass to Shugnan, where the expedition was courteously received by the Bokharan authorities. From Khorog the Panj was followed along the Afghanistan frontier to Ishkashim, whence the return journey was made by almost the same route as on the outward march. The principal collections made are botanical, which include roots, bulbs, seeds, etc., as well as dried specimens. Zoological, geological and meteorological observations have also been made.

Explorations on the Upper Amu-daria and in Daghestan.—The last numbers of the Moscow geographical review *Zemlevyedenie* contain several interesting articles. N. V. Bogoyavlensky gives a sketch of the journey he made in 1898 with Count A. A. Bobrinsky and A. A. Semenoff to the upper Amu, during which journey the party visited lake Iskander-kul and parts of Hissar and Darvaz. Illness has prevented the traveller from giving a report on this journey at an earlier date. From Penjakent, the party went to the Kul-kalan plateau, 9200 feet high, where they found an interesting fauna, including scorpions, which live at this great height, and numerous *Gammaridæ* in the small lakes, or rather the small stony basins which cover this mountain plateau. The Fanagba pass being still impassable at the time of their visit, they took another previously unexplored pass close by, but found on its summit such masses of snow that they had to place their tent-felts on the snow, and to take the horses over them to prevent the animals from sinking too deep. The neighbourhood of Lake Iskanderkul is well known. The party was anxious, however, to make a closer acquaintance with the inhabitants, who, according to Dr. Yavorsky, call themselves Macedoni, and might have been remnants of the Macedonian conqueror's troops. This name, however, was not known to the indigenes whom the party met with, although it is worth noticing that the ethnological features of the inhabitants, who name themselves Tajiks, are quite different from the features of the other Tajiks who live on the headwaters of the Amu. Crossing the Mura pass, the party enjoyed the sudden change in the vegetation and climate on descending from the Pamirs to the Bokhara valleys of the Surkhab, the Khingu, the Vanj, etc., where the khanates of Karateghin and Darvaz are situated. The author describes this granary of Bokhara, and mentions, among other things, the interesting habit of the inhabitants of a village, Bunai, in the valley of the Vanj, of making their summer dwellings in a kind of shanty built in trees in order to escape the bites of all sorts of reptiles. Continuing to follow the most picturesque and dangerous gorge of the Panj, already known from Regel's description, where the footpath runs along a narrow cornice on the extremely steep slope of high cliffs, the party reached the fertile valley of the Aksu, with its chief town Kulab. The villages in this neighbourhood are very wealthy, but only ruins of once very large towns are now seen at the junction of the Aksu with the Amu, which formerly was, as is known, one of the most populous parts of Central Asia. The article is accompanied by a few most beautiful photographs (valleys of the Surkhab and of Khingu) and a few woodcuts. The same number contains a valuable article, by N. I. Andrusoff, on a journey in Daghestan. The map of the Arak-meć anticlinal folding and numerous sketches and sections of the mountains are most interesting, as they show, as in the Rocky mountains, the formidable amount of upheaval, folding, and especially of erosion, to which the Cretaceous and Tertiary deposits have been subjected.

A New Railway to Central Asia.—The Russian Government has decided to build a new and important railway line in its Central Asian dominions, from

Orenburg to Tashkent. Its total length will be 1762 versts (1168 miles). From Orenburg the line will go south to Iletsk, past the Iletsk salt lakes, thence to Kazalinsk, on the Syr-daria, and along the valley of the Syr, past Perovsk, Julek, and Turkestan, to Tashkent. The first division of this line, from Orenburg to the Mugojar mountains, 270 miles, lies in a region well suited for agriculture. Then comes a stretch of land as far as Kazalinsk, which is only suited for nomad Kirghiz; while further on the railway will enter the valley of the Syr, which has already a population of nearly 1,500,000, and, owing to its fertility, offers facilities for immigrants. It is to be remarked that the new line will compete with the Transcaspian line for the export of raw cotton from the Tashkent region.

Lake Aral.—A small expedition, which was sent out last summer by the Turkestan Geographical Society to Lake Aral, under L. S. Berg, has succeeded in finding the landmark placed by General Tillo in 1874 at Kara-tamak, on the north-western shore of the lake. It appeared from a careful levelling that the level of the lake had risen since by 1·21 metre (4 feet).

The Baikal Hydrographic Expedition.—This expedition, which was composed of nine officers and seventy-four sailors, under Colonel Drizhenko, is now back at St. Petersburg, having continued its accurate surveys of the lake and its shores in its middle and northern portions. A map of the southern portion of the lake (on the scale of 4 miles to an inch) is already on sale, and it is hoped that the two other sheets will be ready next spring.

The Jungarian Gobi.—It is known that the greatest uncertainty prevails as to the age of the rocks that are found on the surface of the Gobi. Notwithstanding the most careful search, none of the recent Russian travellers have yet succeeded in finding any traces of the submergence of the Gobi—the lower terrace of the high plateau of Asia—during the Secondary period, except on its outskirts and its slopes. D. A. Klements having brought from his last journey to the Jungarian Gobi some samples of fossils, they were submitted to a careful examination by the Secretary of the St. Petersburg Mineralogical Society, Th. Chernysheff. The samples were taken from a spot situated to the east of Pyevtsoff's route from Kobdo to Guchen (1876), *i.e.* to the south of the Neish-naiman hills, 17 miles east of Gashiuk, and 7 miles north-west of Nyursu. There appear at this spot ash-grey sandstones and conglomerates dipping to the south-east, and to the south of them one finds marls and sandstones containing thin layers of coal, upon which Nyursu is built. The former are full of fossils, but in a state of disintegration, so that Klements was compelled to take big blocks of sandstone, from which the following fossils were obtained: Some Bryozoa (*Polypora*, *Fenestella*), badly preserved; the polypes *Stenopora columnaris*, Schloth, var. *ramosa multigemmata*, Waag.; and the shells of *Productus purdoni*, Dav., *P. asperulus*, Waag., *P. mexicanus*, Schum., *Chonetes transitionis*, Krot., *Rhynchopora nikitini*, Chern., *Reticularia lineata*, Mart., *Martiina semiglobosa*, Chern., *Spirifer cameratus*, Mart., *Bairdia curta*, M'Coy, and several other undefined forms. The character of this fauna is similar to that of the Artinsk horizon of the Urals (intermediate between Permian and Carboniferous), even more so than the fossils brought home by Loczy from Yerkalo, in the Lan-tsan-kiang valley, as well as from Tse-de in the province of Se-chuen, and from Chung-tien and Tali-shau, in Yunnan. It is also worthy of notice that the sandstones and conglomerates of Nyursu are petrographically as well similar to those of the Urals (*Memoirs of the St. Petersburg Mineralogical Society*, vol. xxxviii. 2, 1900).

Glaciation of Northern Siberia.—In the *Verhandlungen* of the St. Petersburg Mineralogical Society (xxxviii. 2), A. P. Gherasimoff gives a further confirmation of the extensive glaciation which took place in the highlands of the

Olekminsk gold-washings system, which was indicated in 1868 by P. Kropotkin, and later by V. Obrucheff. During his exploration of the left-bank tributaries of the Zhuya, M. Gherasimoff found that the present valleys must have been filled with ice, there being on their northern slopes a succession of glacial terraces running all at the same absolute height, and containing boulders brought across the mountain ridges from different localities. Occasionally the boulders are striated. He also establishes the fact that the quaternary deposits in the valleys, which sometimes attain the formidable thickness of 290 feet, contain glacial deposits. As a rule, the lowest layer is of fluviatile origin. It is covered with a great thickness of glacial boulder clay and fine mud, which are covered in their turn with river deposits. Glaciation has produced considerable changes in the former distribution of longitudinal and transversal valleys.

Lieut. Kozloff's Expedition.—The Russian newspapers announce that the leaders of the Tibet Expedition, Lieutenants Kozloff and Kaznakoff, are already on their way from Tsaidam to Kiakhta. It is hoped that in January next they will be the guests of the Geographical Society at St. Petersburg.

Mount Bielukha, Altai Range.—This mountain mass in the Altai range, from which flow the headwaters of the Ob river, has been several times visited by M. Sapozhnikof, and on one occasion he and his companions ascended to the saddle between the two summits (*Izvestiya* of the Imperial Russian Geographical Society, xxxv. 5 and xxxvii. 2). The mass, surmounted by two irregular pyramids, descends in an almost perpendicular wall of rock northwards to the Ak-kem glacier, and more gently southwards to the Katun glacier. To the Bielukha group also belong a lofty snowy plateau adjoining the western summit on the north-west side, and a sharp ridge jutting out north-eastwards from the eastern summit, so that the Ak-kem glacier lies in a semicircle of mountains. The only previous determination of the height of Bielukha was that of Gebler in 1835, who concluded that it must rise at least 11,000 feet above sea-level. M. Sapozhnikof, from several angular measurements, found the mean to be about 14,800 feet for the eastern, and 14,500 for the western summit. The height of the saddle was obtained from the readings of two aneroids, which, corrected for known errors, gave identical results, and the calculated height was about 13,300 feet, which exceeds that of any other elevation in the Katun range. The large quantity of snow on the Bielukha is very noticeable, and has given rise not only to the Russian name, but also the Kalmuk, Ak-siura, and the Kirghiz, Musdu-tau. On his last journey in 1899, M. Sapozhnikof explored the upper valley of the Kochurla, tributary of the Katun, till then unknown to European travellers. Twenty-three miles from the mouth of the Kochurla is a lake 3 miles long, with a maximum breadth of 700 yards. In the middle the depth is 175 feet. The water is muddy, and the temperature in the summer, when M. Sapozhnikof crossed the lake, varied from 48° to 54° Fahr. Its surface lies 5700 feet above sea-level. The lake is marked in rough outline on the map of the Omsk Staff, but of the valley beyond no details are given. This valley is narrow, with rocky cliffs, old moraines, and some wood. The Yoldo-airi falls in cascades into the Kochurla on the right bank 2½ miles above the lake, and 1½ mile further the Miush-tu-airi and the Kani-airi unite to form the river. The former of these M. Sapozhnikof traced to the glacier from which it flows.

Orthography of Place-names in the Philippines.—Since the acquisition of the Philippines by the United States, much difficulty has been experienced with regard to the spelling of the place-names in the islands, owing to the various systems in use. It was felt especially by the Hydrographic Office in connection with the issue of charts, and an appeal for advice to the United States Board on Geographic Names led to the decision that the names in current use, as shown on the best

Spanish official maps and charts, should be followed. In accordance with this decision, a list of about four thousand coast-wise names has been drawn up and published as a special report of the board above mentioned. Another list of about six thousand names has been drawn up under the direction of the Rev. José Algue, S.J., of the Manila Observatory, and printed by the Coast and Geodetic Survey, as an introduction to its 'Atlas of the Philippine Islands.' It has been provisionally accepted by the Board of Geographic Names, whose own list, which in part overlapped the other, has been brought into harmony with it by the alteration of the spelling in the few cases where a difference existed. In the adoption of the board's list, uniformity of spelling rather than facility of pronunciation has been kept in view, and in the case of both a knowledge of Spanish usage will be necessary in order to arrive at a correct pronunciation. Even in the case of Malay words, the Spanish spelling is retained, which is perhaps to be regretted owing to the unusual pronunciation of certain letters, especially *y*, *z*, *c*, and *j*, in that language. By rule 7 of the R.G.S. system, it is laid down that the orthography adopted by other powers in the case of native names in countries under their dominion is to be disregarded, and the British system substituted, a strict adherence to which would forbid the use of the board's system in this country. But the case is perhaps one which would call for a special exception.

AFRICA.

The Dakhla Oasis.—The excellent monograph on the Farafra oasis (*ante*, p. 442), written by Mr. H. J. Beadnell, and published as a part of the report of the geological survey of Egypt for 1899, has been followed by another on the oasis of Dakhla, to the survey of which two months were devoted in the summer of 1898 (Survey Report, 1899, part iv.). Although written in 1900, the report has only been issued during the present year. It supplements in many ways the report on the oases of Dakhla and Kharga, written last year by Mr. A. R. Guest, and summarized in the *Journal* for December last. Mr. Beadnell begins by describing the caravan routes connecting Dakhla with the other oases near, and with the Nile valley at Beniadi. Besides those frequented at the present day, traces of others, now disused, were seen, including one running west from Mut, the most southerly village in the oasis, which the author supposes to have once led to the distant oasis of Kufra, though the great extent and height of the dunes in this direction would probably make the route impracticable at the present day. The main topographical feature in the surroundings of the oasis is the bold escarpment facing southwards and running generally W.N.W. and E.S.E. for at least 125 miles. It separates two entirely different types of country—to the south the low-lying expanse of sandstone, gently undulating and rising imperceptibly to the south; and to the north the high limestone plateau stretching with little alteration of character some 250 miles to the neighbourhood of the Fayum. The cliff is broken into a number of promontories with bays between them, at the extremities of which the beds are cut back so that a gradual slope to the plateau is formed. One of these bays, that to the east of Birbaya, proved to run back further than had been supposed. Owing to differences of character, the lower beds of the cliff stand out and form a low subsidiary plateau and escarpment, the edge being from 2 to 4 miles from the main cliff. The cultivated lands and palm groves, which exceed in extent those of either of the other oases in the Libyan desert, lie, with the villages, on the low ground to the south. The cultivated area, separated into an eastern and western portion by a strip of barren desert, has an extent of 41 square miles, the cultivable but unused land one of 34 square miles, while salines, saliferous land, marsh, and pools, make up other 11 square miles. The

southern route between Dakhla and Kharga was surveyed for the first time by Mr. Beadnell's party, the whole distance being measured by a steel tape; and as the longitude of Kharga was similarly fixed from the Nile valley by Dr. Ball, the resulting longitude of Kasr Dakhl, which is placed 5′ 1″ further west than by Jordan, the surveyor of the Rohlfs Expedition, cannot be greatly in error. Mr. Beadnell gives detailed maps of the chief groups of villages in the oasis, and describes very fully the wells and water-supply of each. The recent fall of the water-level in the wells is ascribed by him to the injudicious sinking of new wells, which often bring inferior land into cultivation while doing enormous damage to first-class wells irrigating good ground. There are large areas of good land uncultivated for want of wells, and it is eminently desirable that Government should take over the full control of future boring operations. The introduction of water-lifting appliances is also a desideratum, while experiments by boring in search of a second water-bearing stratum might lead to valuable results. The entire supply is at present derived from a thick bed of sandstone underlain by a black clay which has not yet been penetrated. Geologically, the various beds, both of the low ground and the escarpment, belong to the upper Cretaceous, the lower Eocene, beds of which form the escarpments around Farafra, first appearing a little distance to the north.

Exploration in the Eastern Congo Basin.—The least accessible portion of the Congo basin is probably that lying to the east of the upper course of the river, from Stanley falls to Nyangwe. Our knowledge of this extensive tract, covered in part by a section of the equatorial forest, is due to the journeys of two or three travellers only, the most important being those of Count von Götzen and of the Belgian officer, Lieut. Glorie, who in 1898 pushed his way to a point overlooking the central rift-valley near the south end of Lake Kivu. Some additions have lately been made to our knowledge by another Belgian expedition under Commandants Sillye and Siffer, which has traversed the region from south to north, first crossing the mountainous zone between the Luama and the northern portion of Lake Tanganyika, and afterwards following the eastern foot of the range to the north end of Kivu, whence the route was continued across the valleys of the Lowa and Lindi to Avakubi on the Aruwimi. The expedition left Kabambare in Manyema on November 24, 1900, and soon crossed the upper Luama, which drains a mountainous country in which the valleys are occupied by vast marshes. The crossing of the water-parting, which had an elevation of 5580 feet, was a work of much difficulty, owing to the steepness of the slopes. From Baraka, at the head of Burton gulf, the shore of Tanganyika was followed northwards, the route afterwards passing between the Rusizi and the western cliff of the rift-valley, which was climbed, near the south end of Kivu, to the village of Gwese, the terminus of the Glorie expedition, the itineraries of the two expeditions being thus linked in a satisfactory manner. In the gorge by which the Rusizi leaves Lake Kivu a natural bridge was discovered. Abreast of Lake Kivu the escarpment falls almost sheer to the lake, and the native path hugs the mountain slopes. The valleys between were cultivated and well peopled. To the north-west of Kivu the mountains rise, in a succession of terraces, to a height of 8000 feet. Travelling is excessively difficult, by reason of the thick vegetation, and, in places, of the precipitous rocks, there being no frequented path. Thick forests of bamboo were met with in the upper region. The great forest was reached fifteen days after leaving Kivu, during which a constant succession of mountain spurs separated by swampy valleys was crossed. The Lowa, upper branches of which, as well as of the Lindi, had previously been crossed, was reached on February 12, and a post established on its banks, after which the route was continued north to Avakubi.

Explorations in the Northern Kamerun.—The expedition to the northern interior of the Kamerun, under the command of Captain von Schimmelpfennig, to which allusion was made in the *Journal* a few months back, was successful in exploring a considerable area of unknown country to the north of the Sanaga, though we regret to learn that the leader has died since his return to the coast. His reports on the expedition, which left the Yaunde station on March 19 last, are printed in the *Deutsches Kolonialblatt* for August 1, and in the third number for the present year of the *Mitteilungen aus den Deutschen Schutzgebieten*. The route led first north across the Sanaga into the hilly country between the main stream and its important northern tributary the Mbam, the course of which has hitherto been laid down on our maps from hearsay only. The district is inhabited by the Vute tribe, and was in part traversed by Lieut. Morgen in 1890, though it has since remained very imperfectly known. The inhabitants were very shy, but showed themselves friendly when once relations could be opened with them. After a number of difficult marches the residence of the chief Ngutte, situated on a picturesque range of hills, was reached, and was found to lie some 30 miles to the north of the position assigned to it on Langhans' map, the chief having apparently shifted his residence. From this point the expedition turned south-west, through grass-land, towards the Mbam; a hitherto unknown tributary, the Mpem, a stream of some importance, being crossed *en route*. The Mbam itself was found to be obstructed by rapids both above and below the crossing-place. The country in front was intersected by hills, varying in height above the sea from 5000 to 6500 feet. Though used to some extent by the natives, the path to the west was found with some difficulty. The people, who belong to a tribe distinct from the Vute, but bearing considerable resemblance to the Bakoko, were on the whole friendly, though at one point a plot to plunder the caravan was only frustrated by the use of force. The country abounded in elephants, rubber, and oil-palms, and is said to offer good prospects for trade. Much was heard of an important town to the north, named Bafu, of the vast size of which fabulous accounts were given. The expedition finally reached Yabassi on the Vuri, whence the return seems to have been made direct to Duala, the capital of the colony. The same number of the *Deutsches Kolonialblatt* also contains an interesting account of a recent visit, by Herr Diehl, to the Manenguba range, which bounds the Vuri basin on the north. An ascent was made of Mount Epocha, an extinct crater lying north of the main range, from which it is separated by a broad valley. To the north and east a well-peopled plain was seen to extend, and behind it rose a high plateau, topped by still higher mountains. An isolated wooded mountain, 6500 feet high, was noticed to the south-east. Both the country and people made a favourable impression, and, the climate being comparatively temperate, Herr Diehl considers that European settlers might find there a scope for their energies.

The Lenfant Expedition on the Niger.—Some account of the expedition under Captain Lenfant, which ascended the Niger in a flotilla of boats during the spring and summer of 1901, for the purpose of carrying supplies to the new military territory between the Niger and Lake Chad, is given in the October number of the *Bulletin of the Comité de l'Afrique Française*. Although the navigation of the river was successfully accomplished, it was only after heroic efforts that the difficulties arising from the low state of the water could be overcome. The stores were transshipped from the ocean steamer at the French enclave on the Forcados mouth of the Niger, the journey as far as Geba (twelve days) being made on a stern-wheeler placed at the disposal of the expedition by the Niger Company. The personnel and stores (amounting to 60 tons) were then embarked on ten barges, which had been towed so far, and the difficulties of the voyage at once began, the

stream being likened to the Rhone at the period of low water, while the thick vegetation on the banks added another obstacle. The 5-mile stretch between Leaba and Wuru presented still more formidable difficulties, the river being hemmed in between precipitous banks and bristling with pointed rocks, among which the stream ran with eddies and whirlpools. The only means of advance was by hauling on tow-lines made fast to the rocks ahead. To pass the Wuru rapid, it was necessary to reduce the loads to 3½ tons per boat, or half the ordinary amount. For 200 yards the current was at the rate of 30 miles an hour. Hardly less difficult were the rapids of Potassi and Garafiri, at the latter of which the main rapid had to be ascended, as the lateral channels were dry, the river being almost at its lowest. Gaya was finally reached on May 7, the last obstacle having been surmounted at Sakassi, 10 miles north of Yellua. Finding, however, that no communication existed between Gaya and Zinder, Captain Lenfant decided to proceed to Sorbo Aussa, where the supplies arrived only just in time to relieve Colonel Peroz from a serious position, scarcity having already made itself felt. Captain Lenfant returned to Bajibo in August, but hoped to make the passage again during high water, when the difficulties would no doubt be lessened.

AMERICA.

Mining in British Columbia.—The annual report for 1900 of the Minister of Mines in British Columbia gives an interesting view of the mining development which has taken place in the province within the last few years. It is pointed out that although the total yearly output is not very great in comparison with that of some of the older mining countries, the wonderfully rapid growth of the mining industry is matter for satisfaction and confidence in the future. The total contribution from the mines of British Columbia to the wealth of the world since 1852 is reckoned at $152,000,000 (roughly £30,000,000), and of this sum $80,000,000 (£16,000,000) is credited to the eleven years 1890–1900. With the one exception of 1892, each year within this period shows a decided advance on the year preceding it, the production in 1900 ($16,000,000) being nearly 32 per cent. higher than that in 1899 ($12,000,000). In the total production since 1852 the largest items are placer gold, and coal and coke (62½ and 49 million dollars respectively), silver, lode gold, lead, and copper following in descending order. The greatest increase of late years is shown under the head of "lode mining" (as distinguished from coal mining and placer mining), lead showing the greatest increase of all. Its value rose from one million dollars in 1898 to over 2½ millions in 1900. Lode gold, silver, and copper show smaller, but still great, proportional increases. By far the most productive districts are West Kootenay and the coast districts, which together account for two-thirds of the whole output. But a more rapid proportional increase since 1898 is shown by the other districts (Cariboo, Cassiar, East Kootenay, Lillooet, and Yale), most of which have more than doubled their output since that year. That from East Kootenay has risen from $161,000 worth in 1898 to $2,800,000 worth in 1900. Both in 1899 and 1900 the mineral production of British Columbia exceeded that of all the other provinces of the dominion (apart from the Yukon territory) combined.

The Grand Cañon of the Colorado.—In June, 1900, Prof. W. M. Davis spent three weeks in the Grand Colorado region. He published a brief account of this trip in the *American Journal of Science* for October, 1900, and more recently a fuller description of it in the geological series, vol. v. No. 4 (May, 1901) of the *Bulletin* of the Museum of Comparative Zoölogy at Harvard. This contains a brief summary of previous work, and a bibliography. The following is a summary of Prof. Davis's results. The flexures and faults may have been formed very early in

the erosional history of the region, and almost exclusively before the cañon cycle. Two denudation stages can be traced—(*a*) the great denudation, which was far advanced before the uplift, which was followed by (*b*) the erosion of the cañon and the stripping of the weak strata from the plateaus. During the great erosion repeated movements took place, after each of which erosion may have reached an advanced stage, before the occurrence of the great series of disturbances. These have yet to be fully analyzed. The main river may be antecedent to some of the many dislocations, but is mainly consequent on displacements caused by faulting in the latter part of the great denudation and the form of the surface at that time. None of the side streams appear to be antecedent. The floor of the Toroweap valley is raised by heavy lava-flows which have withstood erosion of wet-weather floods. A wetter climate in the past has been assumed to explain certain features, but Prof. Davis thinks that the facts cited in support of this hypothesis may be interpreted without it.

The Koppename Expedition in Dutch Guiana.—The November number of the *Tijdschrift* of the Netherlands Geographical Society contains a report by Mr. L. A. Bakhuis on the progress made by his expedition up the Koppename river down to the end of August, at which date the party were in the neighbourhood of the Raleigh falls. On August 5 the baggage and boats of the expedition were placed on board the s.s. *Curaçao*, which entered the mouth of the Koppename the next day. The boats were then towed up the river by a steam-launch as far as Koppenkrisi, beyond which the state of the river made it necessary to proceed by rowing. On August 12, the Raleigh falls, where a camp had been made by an advance-party of the expedition, were reached. Here, while the boats and baggage were being moved above the falls—a 2-mile stretch strewn with rocks and islands—Mr. Bakhuis and the surveyor of the expedition made the ascent of the Voltzberg, an excessively steep isolated summit, in order to take bearings of the country in advance. A path had been cut through the bush, but the summit was inaccessible on the north and west, and it was only on going round to the south side that the ascent could be effected. A neighbouring summit was also climbed, and, the distance between them being measured trigonometrically and used as a base-line, it was possible to lay down the positions of the mountain range to the south-west, which forms the watershed of the Koppename, and of various other summits. The highest peaks of the range, which had hitherto been practically unknown, were put down at about 3600 feet in height. The upper course of the Koppename could only be conjectured, only a strip in the immediate neighbourhood of the Raleigh falls being visible. Meanwhile the boats had ascended the river to the next falls, distant two days and a half by rowing, and had discovered an important tributary entering on the right bank. This was to be ascended for two or three days, if possible, while the baggage was transported beyond the second falls. Mr. Bakhuis proposed, if possible, to make his way to the range forming the water-parting, and to cross over to the Saramakka river, following the latter on his return to the coast.

Austrian Explorations in Brazil.—Prof. von Wettstein, leader of the Expedition to Brazil of which mention was made in the February number of the *Journal* (p. 195), has reported as follows to the Vienna Academy of Sciences on the work accomplished. From the city of São Paulo as headquarters, excursions were first made for the purpose of gaining a general acquaintance with the surrounding country, special attention being paid to the transitional forms between the primæval forest of the coast region and the flora of the "campos" in the interior of the state. The slopes of the Serra do Mar—between São Paulo and the coast—clothed in the richest tropical vegetation, were visited, after which, in June, a longer excursion was undertaken for the thorough examination of the eastern

slope of the Serra do Paranopiacaba. An expedition, in July, into the interior of the states of São Paulo and Parana, was especially rich in results. Beyond the last railway station, a five-days' journey brought the travellers to the Salto Grande, the great fall of the Parana-Panema, which forms the limit of navigation. The great botanical interest of the neighbourhood held the explorers enthralled for a week. A voyage down-stream for several days was then made in canoes, which had been obtained from an Indian tribe resident in the neighbourhood, and the flora of the banks and islands studied. The discovery, among the rapids of the stream, of hitherto unknown types of the family of *Podostemonaceæ* calls for special mention. The return by land to the starting-point of the railway afforded the most favourable opportunity for the detailed study of the adaptation of plant-forms to the dry climate of the interior—that is to say, the xerophytic character of the "campos" flora. In the middle of August, the last major expedition from São Paulo was to be undertaken. It was to lead by Itapetininga, in the region of campos, and across the mountains to the tropical coast zone, and would to some extent afford a means of combining the results of previous excursions. The explorers hoped to be back in São Paulo early in September, and would then, after arranging for the despatch of the material collected, make their way to Rio de Janeiro. Down to August 11, the date of the report, more than nine thousand herbarium specimens and six large cases of preparations in spirits, as well as twenty cases of living plants, had been despatched to Vienna. Among them are many rare and some new forms, which will prove a valuable acquisition for the Vienna botanical garden. The expedition has now returned to Vienna.

POLAR REGIONS.

The Russo-Swedish Degree Measurement.—A third summer has been spent by Russian and Swedish geologists in Spitsbergen, and although good progress has been made with the field-work necessary for the measurement of an arc of the meridian, the whole labours have not yet, as had been hoped, been completed. The Russian section, as is announced in *Petermanns Mitteilungen*, was able, before sailing south, to effect the determination of all the points in the triangulation which fell to its share; but the Swedish party, which has worked throughout in the north of the group, and has therefore met with more hindrances from ice, has been unable to complete the whole programme. The north coast was so blocked by ice that it was found impossible to reach the sphere of action from the west, and only after much delay could it be gained by a circuitous route from the east. The linking of Treurenberg bay with the most northerly Russian point of triangulation on the Chydenius range could not be effected, nor could the most northerly points of the whole network, in the Seven islands, be fixed. It will therefore be necessary to return once more in 1902, if the important work is to reach a successful conclusion.

Borissoff's Expedition to Novaya Zemlya.—We learn from *Petermanns Mitteilungen* that the Russian expedition under Borissoff, which went out to Novaya Zemlya in the summer of 1900 (*Journal*, vol. xvi. p. 689) for surveying purposes, returned to Archangel on September 22. In spite of adverse circumstances, some valuable work appears to have been done. In the autumn of 1900, Borissoff passed through Matochkin Shar, and established a depôt at Chekin bay. Passing into the Kara sea, the ship was caught by ice and driven south, compelling the explorers to abandon her and make for the coast, which was reached at the Savin river. A march of 130 miles northward had then to be made before the depôt was reached. All the observations made during the summer were unfortunately lost with the ship. Early in the present year work was resumed by land,

and during a sledge expedition of a hundred and six days much of the interior was traversed for the first time, lakes and rivers being discovered. A survey of portions of the coast-line was also carried out.

Russian Surveys in the Kara Sea. — The Russian Hydrographical Expedition, which was at work during last summer in the Arctic ocean under Colonel Vilkitsky, has made careful surveys of the three channels which lead into the Kara sea, especially the Matochkin Shar. They made also surveys of the bay of Pechora. Navigation this year was rendered especially difficult by the cold winds.

The Drift-cask Experiment.—We have from time to time alluded to the scheme, first put forward by Commander (now Admiral) Melville of the *Jeannette* Expedition, for the investigation of polar currents by means of specially constructed casks set adrift in the ice (cf. *Journal*, vol. xii. p. 194). In 1899, the matter having been taken up by the Philadelphia Geographical Society at the instance of Mr. Henry G. Bryant, a number of these casks were placed on icefloes in the sea to the northward of Bering Strait by captains of whalers; and further attempts were afterwards made by the revenue cutter *Bear*, though at first without success. This year Captain Tuttle, of the *Bear*, has renewed his efforts, with the result that, in spite of the difficulty and danger of adventuring among the pack for the purpose, some fifteen more casks have been successfully placed on solid icefloes north of the East Siberian coast, the most northerly position at which this was done being in 72° 18′ N., 175° 10′ W., or some 40 miles to the north of the point at which the drift of the *Jeannette* commenced. It is confidently expected that some of the casks will eventually be found on the opposite side of the Arctic basin, though the time requisite for the passage is reckoned at probably four years. It is hoped that other casks may have this year been deposited by whalers to the north of Point Barrow.

The Swedish Antarctic Expedition.—The *Antarctic*, with Dr. Otto Nordenskiöld's expedition on board, left Gothenburg on October 16, and finally sailed for the south polar regions from Falmouth on the 26th. Dr. Nordenskiöld landed from the ship at Dover, and, during a short stay in London, was entertained at luncheon by Sir Clements Markham at the Royal Societies Club. The programme of the expedition was sketched in the October number of the *Journal*. Dr. Nordenskiöld's well-known qualifications in various branches of science, and especially geology, justify the anticipation of valuable results from the expedition.

New South Greenland.—In the *Bolletino della Soc. Geogr. Italiana*, July, 1901, Signor Faustino calls attention to a discovery said to have been made by an American whaling captain named Johnson. In lat. 67° 50′ S. and long. 48° 10′ W. he fell in with a large extent of land, which he named New South Greenland, and his discovery was confirmed by Morrell, who in 1823 followed the coast north-eastwards for 140 miles, and published a narrative of his voyage in 1832. Much doubt has been thrown on this discovery, and Johnson has even been regarded by some as a fabulous person. Signor Faustini maintains that there is no reason to reject Morrell's statement, and chiefly on the ground that no navigator has since visited that part of the Antarctic where the discovery was made. Morrell, having advanced as far as 70° 14′ S. lat., retraced his course to 65°, and then, near the meridian of 48° W. long., sailed south to 67° 52′, where he turned for the last time northwards and followed the coast till it made a bend to the north-west. Of subsequent navigators, Captain Larsen has reached the highest latitude in this sea, namely, 68° 10′ S. lat., but 10° of longitude farther west than Morrell's position. Perhaps Mr. W. S. Bruce may solve the problem.

GENERAL.

The Highest Balloon Ascent yet made.—A note in the November number of the *Deutsche Rundschau für Geographie* gives a brief description of a balloon ascent made on July 31 last by Drs. Berson and Süring, of the Berlin Meteorological Institute, during which a higher altitude was reached than had ever before been attained by man. The highest previous record was made during an ascent by Berson in 1894 (December 5), on which occasion an altitude of 9155 metres (30,022 feet) was reached. This has now been considerably exceeded, the two observers having passed the enormous altitude of 10,300 metres (33,790 feet). Up to 29,500 feet no unusual sensations were experienced, and even up to 33,600 feet the observations could be regularly continued, though consciousness was temporarily lost for brief intervals. Soon after this, however, one of the observers resisted all the efforts of his companion to arouse him, and the latter accordingly was forced to open the valves and so bring about a descent. The exertion thus involved deprived him too of consciousness, and neither of the observers awoke again until nearly an hour had passed, when the balloon was at a height of about 16,000 feet. At the highest point reached the barometer marked 202 mm., and as the balloon was still ascending, it would have been possible to have reached a still higher altitude. The thermometer stood at the freezing-point when a height of 12,470 feet had been reached, and at 33,600 marked −40° (C. or Fahr.).

Bergman's Physical Geography.—Torbern Bergman, born in 1735, was distinguished in many branches of science, and held the chair of chemistry in the University of Upsala. In 1766 he produced his 'Physisk Beskrifning öfver Jord-Klotet,' a work which Peschel styled the first physical geography in the strict sense of the term. In September Mr. John Lindquist read a paper at the Upsala University, now published in pamphlet form, in which he set forth and discussed the outlines of this work, and also gave a sketch of the author's life.

New Alpine Club.—We notice the recent foundation of a Russian Alpine Society at Moscow, which has among its foundators P. P. Semenoff, the Countess Uvaroff, Prof. D. N. Anuchin, B. A. Fedchenko, etc., and has elected as president A. K. von Meck. A Caucasian Alpine Club is in course of foundation.

OBITUARY.

Major F. C. Quicke.

The war in South Africa has claimed a third victim among British African explorers in the person of Major Francis Churchill Quicke, King's Dragoon Guards, who was killed in action at Riverdale, near Harrismith, on October 26. Major Quicke was the second son of the Rev. Charles Penrose Quicke, of Ashbrittle, Somerset, and at the time of his death was aged 34 years. He was educated at Eton, and entered the King's Dragoon Guards in 1887. The excellent work done by him as a member of Major Gibbons' second Zambezi expedition is fresh in the memory of our readers. When, on reaching Sesheke on the upper Zambezi, Major Gibbons and his two principal assistants separated in order to cover as large an extent of country as possible, Captain Quicke was commissioned to explore the northern section of the western basin of the upper Zambezi; and the result of his work was an excellent map of the upper Kwando and Lungwebungu rivers, which were then first followed throughout their whole extent.

Subsequently, after joining his chief at Lialui, he undertook a still more important expedition, in the course of which he went east to the Kafukwe river, north-west to the headstream of the Zambezi, and thence west by the Congo-Zambezi divide towards the West Coast—a total distance of over 2000 miles, whereby he completed a distance of over 5000 miles in eighteen and a half months. On reaching the coast, Mr. Bullough, who had fitted his yacht as a hospital-ship, took him on board in a serious condition. He hung between life and death for three weeks, but six weeks later was sufficiently recovered to travel to Kimberley, where he was given command of a troop of irregular horse, with which he took part in the relief of Mafeking, after which he rejoined his regiment at Aldershot. He was present at the meeting in December last, at which Major Gibbons gave the account of his expedition to the Society, and added a short narrative of his own experiences, which was printed, with Major Gibbons' paper, in the *Journal* for January last. His regiment having been ordered to South Africa in January last, he was promoted to the rank of brevet-major in September for conspicuous service in the field; but his promising career was cut short, as already stated, during a fight near Harrismith towards the end of October. Major Quicke had joined the Society in 1898, having previously made sporting trips in India and Somaliland.

Cav. L. M. d'Albertis.

The death occurred on September 2 last of Cav. Luigi Maria d'Albertis, one of the best known of the early explorers of the interior of New Guinea. Sig. d'Albertis, whose travels in New Guinea extended over a period of some five years, was first attracted to that region by a wish to gain acquaintance at first hand with the wonderful natural history productions of the island, on which Wallace especially had thrown some light during his travels in the Malay archipelago. He therefore gladly accepted the offer made by Dr. O. Beccari in 1872, to accompany that naturalist in one of his voyages of exploration. The south-west coast was the district chosen as the scene of operations, and here Sig. d'Albertis penetrated some distance towards the Arfak range, living for about a month in a Papuan hut at a height of 3600 feet, and reaching, during his excursions, an altitude of 5000 feet. Ill health compelled the abandonment of work for a time, but early in 1875 the traveller settled for some months on Yule island, near Port Moresby, obtaining valuable zoological collections from that previously almost unknown spot. In November of that year he joined Mr. Macfarlane in his pioneer voyage up the Fly river in the mission steamer *Ellangowan*, and in the following year returned to the river in a small steamer placed at his disposal by the New South Wales Government. On this occasion he was able to ascend the river almost to its sources—a distance of over 500 miles from the sea—and thus, for the first time, carried an itinerary to the centre of the vast blank which had hitherto marked the unknown interior on our maps. He also proved satisfactorily the great importance of the Fly river in the hydrographical system of the island. A third visit to the river was made in 1877, after which Sig. d'Albertis returned to Europe, and in November, 1878, presented an account of his explorations to the Society in a paper published in the first volume of the new series of its *Proceedings*. A full account of his wanderings was given to the public in 1880, in two large volumes, entitled, 'New Guinea: What I did and What I saw,' which long remained one of the principal sources of our knowledge of the people and natural history of the island.

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1901–1902.

First Ordinary Meeting, November 11, 1901.—Sir CLEMENTS MARKHAM, K.C.B., President, in the Chair.

ELECTIONS.—*Capt. George Howard Fanshawe Abadie, Royal Scots; Archibald Stewart Annand; Colonel Alfred J. Arnold, D.S.O., 3rd Hussars; Lieut. Harold Cuthbert, D.S.O., Scots Guards; John Francis Etherington; Capt. Sudlow Harrison; William Petch Hewby, Political Officer, Northern Nigeria; Capt. Cecil Lowther, Scots Guards; Jesse Page; Alexander A. G. de Pagenkopff, Attaché to the Imperial Russian Ministry; Lionel Fox Pitt; Major-Gen. G. Upton Prior; Lieut. Cecil Godfred Rawling, Somerset Light Infantry; Geo. Whitfield Ray; Isaac Rooney; Charles Arthur Wood, M.A.*

The Papers read were:—

1. The President's Address.

2. "The Uganda Protectorate, Ruwenzori, and the Semliki Forest." By Sir Harry Johnston, K.C.B., G.C.M.G.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By EDWARD HEAWOOD, M.A., *Librarian*, R.G.S.

THE following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Abh. = Abhandlungen.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce.
C. Rd. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
Iz. = Izvestiya.
J. = Journal.
k. u. k. = kaiserlich und königlich.
M. = Mitteilungen.
Mag. = Magazine.
Mem. = Memoirs, Mémoires.
Met. = Meteorological.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.
Zap. = Zapiski.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

A selection of the works in this list will be noticed elsewhere in the "Journal."

EUROPE.

Alps—Glaciers. **Forel, Lugeon, and Muret.**

Jahrb. Schweiz. Alpenclub 36 (1900-1901): 169-191.

Les Variations périodiques des glaciers des Alpes. Par Dr. F. A. Forel, Dr. M. Lugeon, E. Muret. Vingt-unième rapport. 1900.

Alps—Historical. *Jahrb. Schweiz. Alpenclub* 36 (1900-1901): 192-209. **Knonau.**

Mittelalterlicher Verkehr and Handel über unsere Alpenpässe. Von G. Meyer von Knonau.

Alps—Morphology. *G.Z.* **7** (1901): 447–459. **Hettner.**
Ueber die Oberflächenformen der Hochalpen. Nach den Untersuchungen Edward Richter's. Von Alfred Hettner.

Austria—Dalmatia. *Mém. A. Dijon* **7** (1899–1900): 133–187. **Robin.**
Seize jours de croisière sur les cotes de Dalmatie. Par Albert Robin. *With Illustrations.*

Central Europe. *Fortnightly Rev.* **70** (1901): 605–614. **Coubertin.**
The Problem of Central Europe. By Baron Pierre de Coubertin.
On the race-problem in Austria-Hungary.

Central Europe. *G.Z.* **7** (1901): 361–377, 435–447. **Gradmann.**
Das mitteleuropäische Landschaftsbild nach seiner geschichtlichen Entwicklung. Von Dr. Rob. Gradmann.
This will be specially noticed.

Danube—Historical. *Archæologiai Ertesitö* **21** (1901): 28–34. **Milleker.**
Trois forts romains au Bas-Danube. Par Félix Milleker. [In Hungarian.]

Europe—Cartography. *La G., B.S.G. Paris* **3** (1901): 398–413, 507–514. **Derrécagaix.**
Des cartes d'Europe en 1900. Par Général Derrécagaix.
A historical sketch of the making of the maps of the various European countries.

France. *B.S. Languedoc. G.* **23** (1900): 308–329. **Gruyer.**
Saint-Guilhem-le-Désert. Par M. Paul Gruyer. *With Illustrations.*

France—Auvergne. *Jahrb. Schweiz. Alpenclub.* **36** (1900–1901): 132–148. **Zeller.**
Wanderungen im Vulkangebiet der Auvergne. Von Dr. R. Zeller. *With Illustrations.*

France—Brittany. *G.Z.* **7** (1901): 250–271. **Credner.**
Armorika. Ein Vortrag von Dr. Hermann Credner.
A sketch of the physical history of Brittany.

France—Speleology. *La G., B.S.G., Paris* **4** (1901): 35–45. **Martel.**
Treizième campagne souterraine. Par E.-A. Martel. *With Illustrations.*

Germany. **Ule.**
Der Würmsee (Starnbergersee) in Oberbayern. Eine Limnologische Studie, von Willi Ule. Herausgegeben mit unterstützung des Vereins für Erdkunde und der Carl Ritter-Stiftung zu Leipzig. With Atlas. (Wissenschaftliche Veröffentlichungen des Vereins für Erdkunde zu Leipzig. Fünfter Band.) Leipzig: Duncker & Humblot, 1901. Size 10 × 6½ (atlas 15½ × 12), pp. vi. and 212. *Presented by the Author.*
This will be the subject of a special note.

Germany. *Notizblatt V. Erdk. Darmstadt* (4) **21** (1900): 4–10. **Klemm.**
Bemerkungen zu F. Kinkelins Arbeit "Beiträge zur Geologie der Umgegend von Frankfurt A. M." Von G. Klemm. *With Plates.*
The writer criticizes some of the views expressed in the work referred to.

Germany. **Schwabach.**
Trade of Germany for the year 1900. Foreign Office, Annual No. 2671, 1901. Size 9½ × 6, pp. 46. *Price* 2½*d.*
In spite of a reaction from the unprecedented commercial activity which prevailed at the beginning of 1901, the trade of Germany still shows an increase for the year.

Germany. *Deutsche Rundschau G.* **23** (1901): 481–490. **Werner.**
Die Vogesen und ihre Thäler im Ober-Elsass. Von L. H. Werner. *With Illustrations.*

Germany. **Wüst.**
Beiträge zur Kenntnis des Flussnetzes Thüringens vor der ersten Vereisung des Landes. Von Dr. E. Wüst. (Sonder-Abdruck aus den Mitteilungen des Vereins für Erdkunde 1901.) Halle a. S., Tausch & Grosse, 1901. Size 9½ × 6½, pp. 18. *Map.*
This is the subject of a note (*ante*, p. 615).

Germany—Breslau.
Breslau. Lage, Natur u. Entwickelung. Eine Festgabe dem xiii. Deutschen Geographentage dargeboten vom Ortsausschusse. Breslau: C. T. Wiskott, 1901. Size 8½ × 5½. *With Maps and Illustrations.*

Germany—Coasts. *Globus* **79** (1901): 303–305. **Traeger.**

Die geologische Erforschung der Nordseewatten. Von Dr. Eugen Traeger.

A criticism of a paper by Reinhold Haage in the *Mitteilungen* of the Leipzig Geographical Society.

Germany—Magnetism. *Ann. Hydrographie* **29** (1901): 404–408. ———

Bericht der Deutschen Seewarte über die Ergebnisse der magnetischen Beobachtungen in dem deutschen Küstengebiete und in den deutschen Schutzgebieten während des Jahres 1900.

Germany—Rügen. *Naturw. Wochenschrift* **16** (1901): 393–396. **Graebner.**

Ein botanischer Ausflug nach Rügen. Von Dr. P. Graebner.

Greece. *B.S.G. Lille* **36** (1901): 5–16. **Fougères.**

Un Voyage en Arcadie. Par M. Fougères. *With Map, Plans, and Illustrations.*

A short description of the general physical features of the Peloponesus, followed by an account of recent archæological researches.

Holland—Census. *G.Z.* **7** (1901): 281–286. **Neukirch.**

Vorläufige Ergebnisse der 8 allgemeinen zehnjährigen Volkszählung im Königreich der Niederlande vom 31 Dezember 1899. Von Dr. Karl Neukirch.

Holland—Limburg. *Petermanns M.* **47** (1901): 187–190. **Zondervan.**

Steinkohlen in Niederländisch-Limburg. Von Henri Zondervan.

Hungary—Botany. *Jahrb. Ungar. Karpathen-V.* **28** (1901): 1–59. **Wagner.**

Die Gefässpflanzen des Túróczer Komitates. Von Johann. Wagner.

Hungary—Budapest. **Körösy.**

Die Sterblichkeit der Haupt- und Residenz-stadt Budapest in den Jahren 1891–1895 und deren Ursachen. Von Dr. Josef von Körösy. (Publicationen des Statistischen Bureaus der Haupt- und Residenzstadt Budapest, xxxi.) Berlin: Puttkammer und Mühlbrecht, 1901. Size 10½ × 7½, pp. viii. and 216. *Presented by the Author.*

Hungary—Census. *Deutsche Rundschau G.* **23** (1901): 464–469. **Dienel.**

Die Ergebnisse der Volkszählung in Ungarn 1900. Von Julius Dienel.

Italy. *B.S.G. Italiana* **2** (1901): 684–711. **Crocioni.**

La toponomastica di Velletri. Nota del dott. G. Crocioni.

Italy. *B.S.G. Italiana* **2** (1901): 792–798. **Rosetti.**

Sul Rubicone. Nota del E. Rosetti.

Among the three competitors for identification with the ancient Rubicon, the writer is inclined to give the preference to the Fiumicino.

Italy. *Monthly Rev.* **4** (1901): 62–73. **Strutt.**

Famine and its Causes in Italy. By Edward C. Strutt.

Italy—Campagna. *La G., B.S.G. Paris* **3** (1901): 461–470. **Glangeaud.**

Les volcans du Latium et la Campagne Romaine. Par Ph. Glangeaud. *With Illustrations.*

Italy—Geographical Research. *Riv. G. Italiana* **8** (1901): 337–344. **Porro.**

I Problemi insoluti della geografia d'Italia. Comunicazione al IV. Congresso Geografico Italiano (III. Sezione) del Colonnello Carlo Porro.

The writer mentions a number of important geographical questions needing study in Italy, and urges that they should be taken up systematically.

Italy—Hail Prevention. *Meteorolog. Z.* **18** (1901): 275–278. **Pernter.**

Die Erfolge des Wetterschiessens in Italien, 1900. Von J. M. Pernter.

Statistics show that the cases in which success has been obtained are little more than half as numerous as the unsuccessful cases.

Italy—Naples. **Norway.**

Naples: Past and Present. By Arthur H. Norway. London: Methuen & Co., 1901. Size 8 × 5½, pp. xii. and 362. *Illustrations. Presented by the Publishers.*

This little work is not intended as a guide-book, but rather to supply the broad, general views which are lost in the detail necessary to such a guide. It is written in a pleasing style.

Norway. **Dundas.**

Trade of Norway for the year 1900. Foreign Office, Annual No. 2659. 1901. Size 9½ × 6, pp. 112. *Price* 5½*d.*

Norway. *La G., B.S.G. Paris* **8** (1901): 515–520. **Rabot.**

Nouvelles études de géographie physique dans la Norvège septentrionale. *With Maps and Illustration.*

Based on a work by J. H. L. Vogt in *Norges geologiske Undersögelser.*

Norway. *Alpine J.* **20** (1901): 443–449. **Gatty.**

Sulitelma. By Victor H. Gatty. *With Map and Illustration.*

Norway—Census. ———

Foreløbige Resultater af Folketællingen i Norge, 3 December, 1900. (Aperçu préliminaire des résultats du recensement au 3 décembre 1900 en Norvége.) Udgivne af det Statistiske Central Bureau. Kristiania: H. Aschehong & Co., 1901. Size 10 × 6½, pp. iv. and 22.

Norway—Census. *G.Z.* **7** (1901): 514–525. **Neukirch.**

Die Bevölkerung Norwegens nach der Zählung vom 3 Dezember 1900. Von Dr. Karl Neukirch.

Norway—North Cape. *Deutsche Rundschau G.* **23** (1901): 491–498. ———

Eine Reise nach dem Nordcap. Von L. D. *With Illustration.*

Norway—Tours. ———

The Most Picturesque Routes in Southern Norway. New Revised Edition. Edited by the Skien-Telemarkens Tourist Club. Skien, 1901. Size 7 × 5, pp. 74. *Maps and Illustrations. Presented by D. M. M. Crichton Somerville, Esq.*

Gives, besides a description of Skien and its environs, a description of ten of the most interesting routes from that centre through the lake-land of southern Norway.

Russia. **Cooke.**

Mineral and Metallurgical Industries of Russia. Foreign Office, Miscellaneous, No. 555, 1901. Size 9½ × 6, pp. 48. *Price* 2½*d.*

Russia. *Rev. G.* **49** (1901): 339–357. **Barré.**

Le peuplement et la colonisation de l'Empire russe. Par Paul Barré.

Russia—Caucasia—Daghestan. *Zemlevedenie* **8** (1901): 27–69. **Andrusoff.**

Journey to Daghestan, 1898. By N. Andrusoff. *Map, Sections, and Illustrations.*

Russia—Finland. *G.Z.* **7** (1901): 481–498. **Rosberg.**

Geographische Charakterbilder aus Finland. Dr. J. E. Rosberg.

Russia—Pechora. *Izvestiya Imp. Russ. G.S.* **37** (1901): 132–155. **Novosiltsoff.**

The Lower Pechora. By A. N. Novosiltsoff. [In Russian.]

Russia—St. Petersburg. **Baedeker.**

St. Petersburg und Umgebungen. Handbuch für Reisende, von K. Baedeker. Leipzig: Karl Baedeker, 1901. Size 6½ × 4½, pp. xxiv. and 126. *Maps and Plans. Price* 4*m.*

This is extracted from the new, fifth, edition of Baedeker's Russia.

Russia—Ural Mountains. *Le Globe, Mem. S.G. Genève* **40** (1901): 1–53. **Duparc.**

Deux mois d'exploration dans l'Oural. (Rastesskaya Datcha.) Par le professeur Louis Duparc. *With Map.*

Scandinavia. **Hitchcock.**

Our Trade with Scandinavia, 1890–1900. By Frank H. Hitchcock. (U.S. Department of Agriculture. Section of Foreign Markets. Bulletin No. 22.) Washington, 1901. Size 9 × 6, pp. 124. *Presented by the U.S. Department of Agriculture.*

Spain. *B.R.S.G. Madrid* **43** (1901): 7–61. **Edrisi.**

Descripción de España, por Abu-Abd-allá-Mohamed-Al-Edrisi, traducida por D. Antonio Blázquez.

Spain. *B.R.S.G. Madrid* **43** (1901): 52–61. **Pérez.**

Notas de viajes por España. De Villena á Alcoy y Sierra Aitana. Por D. Eduardo Soler Pérez.

Spain—Rio Esla. *B.R.S.G. Madrid* **43** (1901): 62–111. **Valbuena.**

Sobre el origen del rio Esla. Por D. Antonio de Valbuena.

The Esla (formerly Estula) is the principal tributary of the Duero.

Submarine Valleys. **Lobley.**

The Sub-Oceanic Depression known as "La Fosse de Cap Breton," and the adjacent River Valleys of France and Spain. By Professor J. Logan Lobley. 1900. Size 8½ × 5½, pp. 14. *Presented by the Author.*

The author supports the conclusions of Prof. Hull as to the origin of the submarine depression off the mouth of the Adour, adducing further arguments in their favour.

Sweden. *Globus* **79** (1901): 368–369. **Palleske.**

Das Vorkommen des Pferdes in der schwedischen Steinzeit und der Fund von Ingelstad. Von R. Palleske. *With Illustrations.*

Sweden. **Hamberg.**

Geologiska och Fysiskt-Geografiska Undersökningar i Sarjekfjällen. Af Axel Hamberg. Stockholm, 1901. Size 9½ × 6½, pp. 102. *Maps and Illustrations.*

A careful study of the physical geography of a mountain district in northern Sweden. (See *ante*, p. 617.)

Sweden. **Hollender.**

Om Sveriges Nivåförändringar efter Människans Invandring. Af Artur Hollender. Stockholm, 1901. Size 8½ × 5½, pp. 231–274. *Map.*

On probable changes of level, and the resulting alterations in the position of the coast-line of Sweden. (See *ante*, p. 617.)

Sweden.

Göta Canal. Canal Route between Stockholm and Gothenburg, comprising the Södertelge, Göta and Trollhätte Canals. Stockholm, 1901. Size 8½ × 5½, pp. 46. *Map and Illustrations.*

Description of the "canal-route" from a tourist's point of view.

Sweden—Geology. *B. Geolog. I. University Upsala* **5** (1900): 1–27. **Nordenskjöld.**

Ueber die Kontaktverhältnisse zwischen den archæischen Porphyren ("Hälleflinten") und Graniten im nordöstlichen Småland. Von Otto Nordenskjöld. *With Map.*

Sweden—Lapland. *B. Geolog. I. University Upsala* **5** (1900): 28–80. **Ahlenius.**

Beiträge zur Kenntnis der Seenkettenregion in Schwedisch-Lappland. Von Karl Ahlenius. *With Maps.*

This is noticed in the Monthly Record (*ante*, p. 616).

Sweden and Norway—Commerce. *B.S.G. Lille* **36** (1901): 16–50. **Herteman.**

Étude présentée à la Société de Géographie de Lille. Par Paul Herteman.

The author discusses the facilities offered by Sweden and Norway for the opening of commercial and industrial relations with the north of France.

Switzerland. **Baedeker.**

Switzerland and the adjacent portions of Italy, Savoy, and Tyrol. Handbook for Travellers. By Karl Baedeker. Nineteenth Edition. Leipsic: Karl Baedeker; London: Dulau & Co. 1901. Size 6½ × 4½, pp. xxxviii. and 530. *Maps, Plans, and Panoramas. 2 copies, one presented by the Editor, the other by Messrs. Dulau & Co.*

Turkey—Constantinople. **Sarell.**

Trade of Constantinople for the years 1899 & 1900. Foreign Office, Annual No. 2650, 1901. Size 9½ × 6, pp. 40. *Maps and Plans. Price* **1s. 7d.**

This report contains useful information, with maps, on the existing and projected railways of European and Asiatic Turkey, on the port of Haidar Pasha and its proposed improvement, on coal-mining in Asia Minor, and various other matters.

Turkey—Samos. *B.S.R. Belge G.* **25** (1901): 5–32, 81–124, 177–200. **Hauttecœur.**

La Principauté de Samos. Par Henry Hauttecœur.

Turkey—Skutari. *Riv. G. Italiana* **8** (1901): 420–431. **Baldacci.**

Note Statistiche sul "Vilayet" di Scutari e la legge della Montagna Albanese. Di A. Baldacci.

United Kingdom—Great Britain. **Baedeker.**

Great Britain. Handbook for Travellers. By K. Baedeker. Fifth Edition. Revised and augmented. Leipzic: Karl Baedeker; London: Dulau & Co. 1901. Size 6½ × 4½, pp. lxiv. and 600. *Maps and Plans. Price* **10m.** *Presented by Messrs. Dulau & Co.*

This edition has been carefully revised and brought to date.

United Kingdom—River Mersey. **Nares.**

Report on the Present State of the Navigation of the River Mersey (1900) to the Right Hon. the Commissioners for the Conservancy of the River Mersey. By Vice-Admiral Sir G. S. Nares, K.C.B. London, 1901. Size 9½ × 6, pp. 22. *Presented by the Author.*

ASIA.

Afghanistan. *Deutsche Rundschau G.* **24** (1901): 28–31. **Syrkin.**

Afghanistan. Von Dr. N. Syrkin. *With Map.*

Arabia. *Questions Dipl. et Colon.* **12** (1901): 281–296. **d'Avril.**

Quelques notes sur l'Arabie. Par Baron A. d'Avril. *With Map.*

Deals with various political and historical questions.

Central Asia. **Filchner.**

Jahresb. Frankfurter V. G. u. Statistik **64** and **65** (1899–1901): 166–175.

Ritt über den Pamir und durch Ostturkestan. Von Leutnant W. Filchner.

Central Asia. *G.Z.* **7** (1901): 323–333, 377–383. **Toepfer.**

Der Weg von Osch nach Kaschgar. Aus dem Russischen. Von H. Toepfer.

Translation of a series of articles in the *Novoye Vremya*.

Central Asia—Tian Shan. *Izvestiya Imp. Russ. G.S.* **37** (1901): 58–69. **Korolkov.**

Visit to some glaciers of the Tian Shan. By Y. Korolkov. [In Russian.]

China. **Bigham.**

A Year in China, 1899–1900. With some account of Admiral Sir E. Seymour's Expedition. By Clive Bigham. London: Macmillan & Co., 1901. Size 9 × 6, pp. xii. and 234. *Maps and Illustrations. Presented by the Author.*

This work does not profess to be more than a record of personal experiences and impressions gained during eighteen months' stay in the Far East. These are presented, however, in a readable form, and should help towards the gaining an accurate idea of the present condition of things in the countries dealt with. The author took part in Admiral Seymour's Expedition, visited Manchuria, Eastern Siberia, and Korea, and penetrated inland to Western Sechuan.

China. **Parker.**

China. Her History, Diplomacy and Commerce from the earliest times to the present day. By E. H. Parker. London: John Murray, 1901. Size 8½ × 5½, pp. xx. and 332. *Maps and Frontispiece. Price 8s. net. Presented by the Publisher.*

A distinctly valuable work, presenting an instructive view of the history of the trade and foreign relations of the Chinese empire.

China—Manchuria. *Monthly Rev.* **5** (1901): 58–72. **Colquhoun.**

Manchuria in Transformation. By Archibald R. Colquhoun.

China—Manchuria. *J. United Service I. of India* **30** (1901): 213–236. **Dowding.**

The Russian Campaign in Manchuria, 1900. By Capt. H. H. Dowding, Essex Regiment. *With Map.*

China—Peking. *Tour du Monde* **7** (1901): 469–480. **Laguerie.**

Pékin, au lendemain de la délivrance des Légations. Par M. Villetard de Laguerie. *With Illustrations.*

China—Yangtse. *Ann. Hydrographie* **29** (1901): 387–391. **Hofmeier.**

Yangtze-Fahrt eines deutschen Linienschiffes. Reisebericht S. M. S. "Weissenburg," Kommandant Kapt. z. S. Hofmeier.

The voyage was made early in 1901. Observations on the depths and currents are given.

Chinese Empire. *Izvestiya Imp. Russ. G.S.* **37** (1901): 1–57. **Palibin.**

Preliminary Report of a Journey to Eastern Mongolia and China. By I. V. Palibin. [In Russian.]

Chinese Turkestan. **Church.**

Chinese Turkestan with Caravan and Rifle. By Percy W. Church. London: Rivingtons, 1901. Size 9 × 6, pp. xii. and 208. *Map and Illustrations. Price 10s. net. Presented by the Publishers.*

This is avowedly merely a record of travel and sport, little attention being paid by the author during his journey to geographical or political questions. His routes led him into some regions not often visited by Englishmen, especially in the Tian Shan, which was crossed to the south of Urumtsi.

Dutch East Indies. **Van den Berg.**

Bijd. Taal-, Land- en Volkenk. Ned.-Indië **9** (1901): 1–80.

De Mohammedaansche Vorsten in Nederlandsch-Indië. Door Prof. L. W. C. van den Berg.

On the ruling class among the Mohammedans of the Malay archipelago.

Eastern Asia—Meteorology. *Meteorolog. Z.* **18** (1901): 241–249. **Bergholz.**

Die Luftdruckverhältnisse, und die Windbewegungen im "Fernen Osten." Von P. Bergholz. *With Diagrams.*

Based on the work at the French Zikawei Observatory, near Shanghai.

French Indo-China. **Barthélemy.**

En Indo-Chine. 1896–1897. Tonquin, Haut Laos, Annam Septentrional, par le Marquis de Barthélemy. Paris: Plon-Nourrit et Cie. Size 7½ × 5, pp. 376. *Maps and Illustrations.*

The Count de Barthélemy has been one of the most energetic of recent French explorers in Indo-China. The results of one of his journeys were summarized in vol. xv. of the *Journal* (p. 175). The present work deals, however, with an earlier journey only, which led to Luang Prabang from Vinh, on the coast of Tong-king, in part by the valley of the Song-ka. The itinerary is clearly shown on five sheets on the scale of 1 : 250,000.

French Indo-China. *La G., B.S.G. Paris* **3** (1901): 489–498. **Barthélemy.**

Reconnaissance chez les Moïs Stiengs et aux environs du mont Djambra. Par Pierre de Barthélemy. *With Map and Illustration.*

The journey here described was carried out in 1899–1900, or subsequently to those noticed in the *Journal* for last year (vol. xv. p. 175).

French Indo-China. *La G., B.S.G. Paris* **4** (1901): 153–161. **Orléans.**

De Kratié à Nha-Trang, à travers la province du Dar-Lac. Par H. d'Orléans. *With Map.*

An account of the prince's latest journey undertaken early in 1901.

French Indo-China—Tongking. *B.S.G. Lille* **38** (1901): 100–114. ———

Impressions d'un Lillois au Tonkin.

Contains interesting details on the present condition and prospects of Tongking.

India. **Boulger.**

India in the Nineteenth Century. By Demetrius C. Boulger. London: H. Marshall & Son, 1901. Size 8½ × 5½, pp. viii. and 360. *Map and Illustrations. Price 6s. net. Presented by the Publishers.*

In view of the important problems now awaiting solution in India, this attempt to trace, for the benefit of the general public, the growth of the British Empire in that country to the present day should prove of much use. Although the author's views on some questions, *e.g.* the certainty of an ultimate struggle with Russia for the possession of India, will not meet with universal acceptance, his conclusions are for the most part sensible and unbiased. He considers that, with all deductions made, there is an undoubted balance to the good in what we have done to benefit India materially, and that the people as a whole appreciate the benefits of our rule. He is no doubt correct in holding that such appreciation is more just and general among the masses than among some of the classes forming educated society, who are naturally more disposed to regard the present rulers as intruders.

India—Antiquities. **Foote.**

Government Museum, Madras. Catalogue of the Prehistoric Antiquities. By R. Bruce Foote. Madras, 1901. Size 10 × 6, pp. xx. and 132. *Plates. Price 8s. Presented by the Madras Government Museum.*

India—Archæology. **Foote.**

Government Museum, Madras. Catalogue of the Prehistoric Antiquities. By R. Bruce Foote. Madras, 1901. Size 10 × 6, pp. xx. and 132. *Plates. Presented by the Museum.*

India—Assam. **McKee.**

Progress Report of Forest Administration in the Province of Assam for the year 1899–1900. By J. A. McKee. Size 13 × 8, pp. 71. Shillong, 1900. *With Map.*

India—Bombay. *Indian Antiquary* **30** (1901): 257–268. **Fleet.**

Notes on Indian History and Geography. By J. F. Fleet.

These notes relate to the Dharwar district of Southern Bombay.

India—Burma. **Scott and Hardiman.**

Gazetteer of Upper Burma and the Shan States. In Five Volumes. Compiled by J. George Scott, assisted by J. P. Hardiman. Part ii. vol. i. (pp. xii. and 550);

vol. ii. (pp. xvi. and 802); vol. iii. (pp. xii., 438, and viii.). Rangoon, 1901. Size 10½ × 7. *Plans. Presented by J. G. Scott, Esq.*

The two volumes of the first part of this valuable work were noticed in the last volume of the *Journal* (p. 549). Part ii. consists in an alphabetically arranged dictionary of the places of Upper Burma and the Shan States, and embodies a vast amount of information on the geography, history, ethnology, antiquities, etc., of those countries. The longer articles, such as those on Mandalay, the Salwin, etc., form complete monographs of the places dealt with.

India—Earthquake. *Naturw. Wochenschrift* **1** (1901): 2-4. **Walther.**

Die geologischen Wirkungen des indischen Erdbebens vom Jahre 1897. Von Prof. Johannes Walther. *With Illustrations.*

India—Famine Prevention. *Imp. and Asiatic Quarterly Rev.* **12** (1901): 33-51. **Innes.**

Prevention of Famine in India. By L. C. Innes.

Urges the importance of re-forestation as a preventive of drought.

India—Himálaya. **Workman.**

In the Ice World of Himálaya. Among the Peaks and Passes of Ladakh, Nubra, Suru, and Baltistan. By Fanny Bullock Workman and William Hunter Workman. London: T. Fisher Unwin, 1901. Size 8½ × 5½, pp. xvi. and 204. *Maps and Illustrations. Price* 6*s. Presented by the Publisher.*

A cheaper issue, apparently without modification, of the work already noticed in the *Journal*.

India—Irrigation. **Cotton.**

A Letter and Two other Papers on the water of the Great Rivers of India as essential to the prosperity of the Nation and the only possible means of preventing Famine, after Seventy-three Years' study of the subject. By Major-General F. C. Cotton, C.S.I. London: Rivingtons, 1901. Size 8½ × 5½, pp. 48. *Price* 1*s. Presented by the Publishers.*

India—Lushai Hills. *Records Botanical Surv. India* **1** (No. 13) (1901): 331-369. **Gage.**

A Botanical Tour in the South Lushai Hills. By Lieut. A. T. Gage. *With Map.*

The journey here briefly described was made in the spring of 1899. The bulk of the paper consists of a list of the plants collected, with statements as to their distribution.

India—Madras. *Globus* **80** (1901): 87-91. **Oppert.**

Die Felsentempel von Mámallapuram oder Seven Pagodas. Von Prof. G. Oppert. *With Illustrations.*

India—Sikkim. **O'Connor.**

Routes in Sikkim compiled in the Intelligence Branch of the Quartermaster-General's Department in India. By Captain W. F. O'Connor. Calcutta: 1900. Size 13 × 8½, pp. 90. *Maps. Presented by the Assist. Quarter-Master-General, Intelligence Branch.*

This is noticed in the *Journal* for August (p. 161).

Japan—Earthquake. **Davison.**

The Great Japanese Earthquake of October 28, 1891. By Charles Davison, Sc.D. (From the *Geographical Journal* for June, 1901.) Size 10 × 6½, pp. 22. *Diagrams and Illustrations.*

Korea. *Petermanns M.* **47** (1901): 179-182. **Bretschneider.**

Russland und Korea. Von E. Bretschneider.

Analysis of the important Russian work on Korea, published last year under the auspices of the Russian Minister of Finance.

Korea. **Cubbins.**

Trade of Corea for the year 1900. Foreign Office, Annual No. 2687, 1901. Size 9½ × 6, pp. 26. *Sketch-map. Price* 3½*d.*

Malay Archipelago—Amboina. **Baren.**

Tijds. K. Ned. Aard. Genoots. Amsterdam **18** (1901): 678–687.

Beschrijving van het schiereiland Letimor volgens W. Mickler. Door J. van Baren.

Description of the southern portion of Amboina from a survey carried out by Captain Mickler in 1867.

Malay Archipelago—Bali. **Schwartz.**
Tijds. Indische Taal-, Land- en Volkenk. **43** (1901): 554-560.

Rapport van eene reis van den Controleur voor de politieke aangelegenheden vergezeld door den Poenggawa van Soekasada Goesti Njomen Raka van 27 Januari t/m 7 Februari 1900. *With Map and Plan.*

Malay Archipelago—Borneo. *Mission Field* **46** (1901): 138-145, 366-375 **Leggatt.**

Life among the Dyaks. By the Rev. F. W. Leggatt. *With Illustrations.*

Malay Archipelago—Celebes. **Kruijt.**
Bijd. Taal-, Land- en Volkenk. Ned.-Indië **9** (1901): 148-160.

Het Ijzer in Midden-Celebes. Door Alb. C. Kruijt. *With Plates.*

Account of iron-smelting by the natives of Central Celebes. The existence of iron in this district has been known since the days of the old Dutch East India Company.

Malay Archipelago—Java. **Davids.**

Trade of Java for the year 1900. Foreign Office, Annual No. 2665, 1901. Size 10 × 6, pp. 22. *Price* 1½*d.*

Malay Archipelago—Java. **Kohlbrugge.**
Bijd. Taal-, Land- en Volkenk. Ned.-Indië **9** (1901): 81-147.

Die Tĕnggĕresen. Ein alter Javanischer Volksstamm. Ethnologische Studie. Von Dr. J. H. F. Kohlbrugge.

Malay Archipelago—Java. **Oudemans.**
K.A.W. Amsterdam, P. Sec. Sci. **3** (1901): 549-560.

On the contents of the sixth and last part of the Report "die Triangulation von Java," lately presented to the Academy, in the name of the Netherlands Government. By Prof. J. A. C. Oudemans. *With Chart.*

The author describes the method adopted for the calculations of altitudes.

Malay Archipelago—Sumatra. *Globus* **79** (1901): 245-250, 267-273, 278-281. **Hagen.**

Eine Besteigung des Vulkans Kaba auf Sumatra. Von Dr. B. Hagen. *With Map and Illustrations.*

This volcano was visited by Dr. H. O. Forbes during his explorations in the Malay Archipelago, but Dr. Hagen was able to devote more time to its examination, and to arrive at valuable deductions as to recent changes in the crater.

Malay States. **Treacher.**

Report by the Acting Resident-General of the Federated Malay States to His Excellency the Acting High Commissioner (Sir Frank A. Swettenham, K.C.M.G.). Kuala Lumpur, 1901. Size 13½ × 8½, pp. 20. *Diagrams.*

The report opens with a sketch of the history of the Malay States since they first came under British protection.

Persia—Isfahan. *Deutsche Rundschau G.* **23** (1901): 433-436. **Schulz-Baumgärtner.**

Isfahan, die persische Kunstmetropole. Von Dr. Walter Schulz-Baumgärtner. *With Illustrations.*

Philippine Islands. **Sinclair.**

Trade of Philippine Islands for the year 1900. Foreign Office, Annual No. 2638, 1901. Size 9¼ × 6, pp. 26. *Price* 2*d.*

Russia—Siberia. *J. Anthrop I.* **31** (1901): 65-110. **Sumner.**

The Yakuts. Abridged from the Russian of Sieroshevski. By W. G. Sumner.

Russia—Siberia—Mammoth. *Globus* **80** (1901): 85-87. **Adelung.**

Ueber den jüngsten Fund einer Mammutleiche in Ostsibirien. Von Dr. N. v. Adelung.

Russia—Transcaucasia. *National G. Mag.* **12** (1901): 300-309. **Hovey.**

The Old Post-Road from Tiflis to Erivan. By Esther Lancraft Hovey. *Illustr.*

South-Western Asia. *National G. Mag.* **12** (1901): 249-265, 291-299. **Williams.**

The Link Relations of Southwestern Asia. By Talcott Williams, LL.D. *Maps.*

On the importance of South-Western Asia as a meeting-ground of the three continents of the Old World.

Turkey—Armenia. *B.S.G. de l'Est* **21** (1900): 505-521. **Artignan.**

Le commerce des Arméniens au XVII^e^ siècle. Par le docteur Artignan.

Turkey—Erzerum. **Lamb.**

Trade of Erzeroum and District for the year 1900. Foreign Office, Annual No. 2657, 1901. Size 9½ × 6, pp. 16. *Price* 1*d.*

Turkey—Mesopotamia. *Oester. Monats. Orient* **27** (1901): 63-68. ——

Aus Mesopotamien.

A report of the Austrian Consul at Baghdad on the trade and general condition of Mesopotamia.

Turkey—Syria. **Drummond Hay.**

Trade of Beirut and the Coast of Syria for the year 1900. Foreign Office, Annual No. 2662, 1901. Size 10 × 6, pp. 20. *Price* 1½*d.*

AFRICA.

Africa—Historical. **Trant.**

Jahresb. Frankfurter V.G. u. Statistik **64** *and* **65** (1899-1901): 155-159.

Die Kenntnis Afrikas im Altertum. Von Dr. H. Trant.

Africa—Labour Question. *Kolon. Z.* **2** (1901): 273-274. **Peters.**

Organization der afrikanischen Arbeit. Von Carl Peters.

The writer recommends the introduction of compulsory labour in the African Colonies, the compulsion exercised by hunger in Europe being absent in the case of the Negro.

Africa—Zoology. *P. Zoolog. S.* 1901 (vol. ii.): 3-6. **Sclater.**

Mr. Sclater. Exhibition of an original water-colour painting, by Sir Harry Johnston, K.C.B., and remarks upon the newly discovered African mammal, the Okapi. *With Plate.*

Angola. **Nightingale.**

Trade of Angola for the year 1900. Foreign Office, Annual No. 2721, 1901. Size 9½ × 6, pp. 14. *Price* 1*d.*

Basutoland. *B.S. Neuchateloise G.* **13** (1901): 136-140. **Christol.**

Souvenir d'une excursion à la cascade de la Maletsunyane (Pays des Ba-Souto). Par Frédéric Christol. *With Illustration.*

British Possessions. *Rev. G.* **49** (1901): 289-306. **Leblond.**

La politique anglaise et l'Afrique. Par Lieut.-Colonel Leblond.

British South Africa. *B.S. Neuchateloise G.* **13** (1901): 84-98. **Béguin.**

De Nalolo au Mosi-Oa-Thunya (juillet-août 1898). Par Eugène Béguin.

Canary Islands. *T. Canadian I.* **7** (1901): 29-102. **Campbell.**

Critical examination of Spanish Documents relative to the Canary Islands, submitted to the writer by Senor Don Juan Bethencourt Alfonso, of Tenerife. By John Campbell, LL.D.

Cape Colony. *La G., B.S.G. Paris* **4** (1901): 162-167. **Dehérain.**

La toponymie de la colonie du cap de Bonne-Espérance au xviii.e siècle. Par H. Dehérain.

Congo—Malaria. *B S. d'Études Colon.* **8** (1901): 543-550. **Broden.**

La prophylaxie de la malaria au Congo. Par A. Broden.

Dahomey. **Arthur.**

Trade of Dahomey for the year 1900. Foreign Office, Annual No. 2706, 1901. Size 9½ × 6, pp. 16. *Price* 1*d.*

Egypt. **Garstin.**

Egypt, No. 2 (1901). Despatch from His Majesty's Agent and Consul-General at Cairo, inclosing a Report as to Irrigation Projects on the Upper Nile, etc. By Sir William Garstin, K.C.M.G. London: Eyre & Spottiswoode, 1901. Size 13 × 8½, pp. 58. *Maps. Price* 3*s.* 6*d.*

This was fully dealt with in the October number of the *Journal.*

Egypt—Dakhla Oasis. **Beadnell.**

Survey Department, Public Works Ministry. Geological Survey Report, 1899. Part iv. Dakhla Oasis: its Topography and Geology. By Hugh J. L. Beadnell. Cairo, 1901. Size 10½ × 7½, pp. 108. *Maps and Sections.*

This is analyzed in the Monthly Record (*ante*, p. 621).

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Egyptian Sudan. *P. Zoolog. S.* 1901 (vol. ii.): 291–298. **Dunn.**
Field-Notes on the Antelopes of the White Nile. By Captain Henry N. Dunn.

Egyptian Sudan. **Muriel.**
Report on the Forests of the Sudan. By C. E. Muriel. Cairo, 1901. Size 10 × 6½, pp. 24 and 9.
This was noticed in the Monthly Record for October (p. 442).

French Congo. *Deutsche Rundschau G* **23** (1901): 514–516. **Cureau.**
Dr. Cureau's geodätische Arbeiten in Hoch-Ubangi. *With Map.*

French Congo. *La G., B.S.G. Paris* **3** (1901): 524–526. **Brousseau.**
Note sur la géologie du Gabon et des monts de Cristal.

French Congo. *La G., B.S.G. Paris* **4** (1901): 89–96. **Demars.**
Le plateau central du Congo français. Par Lieutenant Demars.
On the structure and morphology of the mountain zone between the middle Congo and the coast.

French Guinea. *Deutsche Rundschau G.* **23** (1901): 507–512. **Mohr.**
Französisch-Guinea. Von Dr. Kurt Paul Mohr.

French Sahara. *Questions Dipl. et Colon.* **12** (1901): 218–223. **De la Vaissière.**
Arguin et Portendick. Par R. de la Vaissière. *With Map.*

French Somali Coast. *Ann. G.* **10** (1901): 370–373. **Brisse.**
Djibouti et le chemin de fer du Harar. Par M. André Brisse.

French West Africa. **D'Ollone.**
Mission Hostains-D'Ollone, 1898–1900. De la Côte d'Ivoire au Soudan et à la Guinée par le Capitaine D'Ollone. Paris: Hachette et Cie, 1901. Size 10 × 6½, pp. 314. *Maps and Illustrations. Presented by the Publishers.*
A detailed account of the important expedition from the Ivory Coast to the Sudan which has frequently been alluded to in the *Journal* (cf. vol. xvi. p. 348). It forms a valuable addition to the literature of West Africa.

French West Africa. *Rev. G.* **49** (1901): 136–155, 204–227. **Dornin.**
Du Soudan au Maroc et à l'Algérie. Par Pierre Dornin. *With Map.*
A general sketch of the course of French advance in West and North Africa, with an appreciation of the value of the territories acquired, on which the writer takes a sober view.

French West Africa. *Scottish G. Mag.* **17** (1901): 414–429, 480–492. ———
France and the Penetration of the Central Sudan. *With Map.*
A summary of recent French activity in the Chad region.

Gambia. **Denton.**
Gambia. Report for 1900. Colonial Reports, Annual No. 325, 1901. Size 9½ × 6, pp. 18. *Price* 1½*d.*

German East Africa. *Kolon. Z.* **2** (1901): 292–295, 312–315. **Bendix.**
Einführung der Kommunalverwaltung in Deutsch-Ostafrica. Von Ludwig Bendix. *With Illustrations.*
On recent attempts on the part of the authorities in German East Africa to organize a system of government in which the natives shall be represented.

German East Africa. *Beiträge Kolonialpolitik* **3** (1901–1902): 69–89. **Engelhardt.**
Meine Reise durch Uhehe, die Ulanganiederung und Ubena über das Livingstone-Gebirge zum Nyassa. Von Hauptmann Engelhardt. *With Illustrations.*

German East Africa. *Globus* **80** (1901): 60–64. **Leue.**
Ein Marsch durch Uwinsa [Deutsch-Ostafrika]. Von A. Leue.

German East Africa. **Wauters.**
Voyages en Afrique de Bruxelles a Karéma—Le Royaume des Eléphants. Par A. J. Wauters. Bruxelles: J. Lebègue & Cie [not dated]. Size 9 × 6, pp. 180. *Illustrations.*
This little work is welcome as giving, for the first time, a full account of the first Belgian Expedition to East Africa (that of 1877 under Crespel and Cambier), which was sent out under the auspices of the International African Association.

Kamerun. *Deutsch. Kolonialblatt* **12** (1901): 550–553. **Diehl.**
Reisebericht des Richters Diehl.

Kamerun. *Deutsch. Kolonialblatt* **12** (1901): 548–550. **Schimmelpfennig.**
Expedition v. Schimmelpfennig. *With Sketch-maps.*
These two papers are dealt with in the Monthly Record (*ante*, p. 623).

Kamerun. *Deutsche Kolonialzeitung* **18** (1901): 245–247. **Scholze.**
Das Bakwirivolk. Von J. Scholze.
The Bakwiri inhabit the southern slopes of the Kamerun range.

Lagos. **Archer.**
Lagos Report for 1899. Colonial Reports, Annual No. 321, 1901. Size 9½ × 6, pp. 28. *Price* 2*d.*
The interior is reported to be settling down and accepting civilization peaceably.

Morocco. *B.R.S.G. Madrid* **43** (1901): 112–143. **Diaz.**
Por España! Memoria premiada en el certamen de Melilla. Presentada por D. Francisco de Francisco y Díaz.
Discusses the importance of Melilla for Spanish relations with Africa.

Morocco. *Ann. G.* **10** (1901): 330–345. **Flotte-Roquevaire.**
Essai d'une carte hypsométrique du Maroc. Par M. R. de Flotte-Roquevaire. *With Map.*

Sahara. *Questions Dipl. et Colon.* **12** (1901): 65–72. **Terrier.**
Les deux rives françaises du Sahara. Par Auguste Terrier.
The writer shows into what intimate relations with the Sahara France has been brought by recent events, in the south no less than in the north.

Senegal. *La G., B.S.G. Paris* **4** (1901): 1–20. **Cligny et Rambaud.**
Le sol du Sénégal. Par Cligny et Rambaud. *With Maps and Illustrations.*

Transvaal. *Tijds. K. Ned. Aard. Genoots. Amsterdam* **18** (1901): 628–667. **Hettema.**
Geschiedenis van het grondgebied der Zuid-Afrikaansche Republiek. Door H. Hettema, jun. *With Map.*
A sketch of the historical geography of the Transvaal.

Tunis. *Ann. G.* **10** (1901): 346–369. **Monchicourt.**
Le Massif de Mactar, Tunisie centrale. Par M. Ch. Monchicourt. *With Plates.*

Uganda. *J. Anthrop. I.* **31** (1901): 117–130. **Roscoe.**
Notes on the Manners and Customs of the Baganda. By the Rev. John Roscoe.

West Africa—Sailing Directions. ———
Africa Pilot. Part ii. Containing Sailing Directions for the West Coast of Africa, from the River Cameroon to the Cape of Good Hope, including the Islands of Ascension, St. Helena, and Gough, and the Tristan da Cunha Groups. Fifth Edition. London: J. D. Potter, 1901. Size 9½ × 6, pp. xxii. and 386. *Index charts. Price* 3*s.* 6*d. Presented by the Hydrographer, Admiralty.*

NORTH AMERICA.

America. *Deutsche Rundschau G.* **23** (1901): 498–507. **Jüttner.**
Fortschritte der geographischen Forschungen und Reisen im Jahre 1900. 2. Amerika. Von Dr. J. M. Jüttner.

Canada—Eskimo. *B.S. Neuchateloise G.* **13** (1901): 158–176. **Pittard.**
Contribution à l'étude anthropologique des Esquimaux du Labrador et de la baie d'Hudson. Par le Dr. Eugène Pittard.

Canada—Newfoundland. **Clôture.**
A travers le Monde, Tour du Monde **7** (1901): 209–211, 217–219, 225–227.
La Question du French Shore. Par Joseph de Clôture. *Map and Illustrations.*

Canada—Ontario. *T. Canadian I.* **7** (1901): 139–186. **Wilson.**
Physical Geology of Central Ontario. By Alfred W. G. Wilson. *With Maps and Illustrations.*

Mexico. **Biorklund.**
Trade of Mexico for the year 1900. Foreign Office, Annual No. 2693, 1901. Size 9½ × 6, pp. 42. *Price* 2½*d.*

Niagara Falls. *T. Canadian I.* 7 (1901): 7–14. **Currie.**

On the Ancient Drainage at Niagara Falls. By P. W. Currie. *With Illustrations.*

The writer accepts the theory of Dr. J. W. Spencer in regard to the old water-courses at Niagara, adding proofs from his own observations.

North America. **Fountain.**

The Great Deserts and Forests of North America. By Paul Fountain. London: Longmans & Co., 1901. Size 9 × 6, pp. x. and 296. *Price* 9*s.* 6*d. net. Presented by the Publishers.*

Though dealing with regions well known both to the geographer and naturalist, this work stands distinctly above the general level of books of travel. The author possesses in a high degree the power, too often wanting in travellers, of presenting vivid pictures of nature and wild life, which enable the reader to whom the pleasure of actual travel is denied, to realize the true conditions of countries remote from his own. The book supplies an illustration of the fact that good work may be done without passing the limits of the fairly well known.

United States. *National G. Mag.* 12 (1901): 373–377. ———

Boundaries of Territorial Acquisitions. *With Map.*

Summarizes the conclusions of a conference, the report of which has lately been published by the Census Bureau.

United States. *National G. Mag.* 12 (1901): 362–369. **Moore.**

The Weather Bureau. By Willis Moore, LL.D.

A sketch of the progress of meteorological science in the United States.

United States. ———

Annual Reports of the War Department for the fiscal year ended June 30, 1900. Report of the Chief of Engineers. 8 Parts. Washington, 1900. Size 9½ × 6, pp. 5536. *Maps and Plates. Presented by the United States Army.*

United States—Arizona. *Rep. Smithsonian I.* (1899): 289–307. **Ward.**

The Petrified Forests of Arizona. By Lester F. Ward. *With Illustrations.*

Reprint of a report to the U.S. Geological Survey. The forests alluded to have recently been placed under adequate protection.

United States—California. *J. Geology* 9 (1901): 330–336. **Nutter.**

Sketch of the Geology of the Salinas Valley, California. By Edward Hoit Nutter. *With Maps and Sections.*

United States—Cement Industry. **Bell.**

Cement Industry of the United States. Foreign Office, Miscellaneous, No. 556, 1901. Size 9½ × 6, pp. 8. *Price* ½*d.*

United States—Coal and Coke. **Bell.**

Coal and Coke Trade of the United States. Foreign Office, Miscellaneous, No. 562, 1901. Size 10 × 6, pp. 20. *Price* 1½*d.*

United States—Horse Industry. **Erskine.**

Horse Industry in the United States. Foreign Office, Miscellaneous, No. 563, 1901. Size 9½ × 6, pp. 14. *Price* 1*d.*

United States—Idaho and Montana. **Goode.**

B. United States Geol. Surv. No. 170 (1900): pp. 66.

Survey of the Boundary Line between Idaho and Montana from the International Boundary to the crest of the Bitterroot Mountains. By Richard Urquhart Goode. *With Map and Illustrations.*

Field work for the fixing of this boundary was carried out in the years 1897–99.

United States—Indian Territory. **Fitch.**

B. United States Geol. Surv. No. 175 (1900): pp. 142.

Triangulation and Spirit Leveling in Indian Territory. By C. H. Fitch. *Maps.*

Gives the results of operations carried out from 1895 to 1898.

United States—Indiana. *J. Geology* 9 (1901): 437–438. **Campbell.**

Evidence of a local subsidence in the Interior. By John T. Campbell.

Bench-marks cut during levelling operations in 1883 show that a subsidence of 10 inches has since taken place at one spot. The Charleston earthquake is suggested as a cause.

United States—Kentucky. **Semple.**

The Anglo-Saxons of the Kentucky Mountains: A Study in Anthropogeography. By Miss Ellen Churchill Semple. (From the *Geographical Journal* for June, 1901.) Size 10 × 6½, pp. 36. *Illustrations.*

United States—Lakes. *Rep. (U.S.) Chief of Engineers* (1900): 5317-5401. ———

Northern and North-Western Lakes—Correcting and issuing Charts—Surveys—Water-levels. *With Map, Diagrams, etc.*

This report contains a large amount of information bearing on the hydrography of the great American lakes, including investigations of lake-levels, discharges of the connecting rivers, etc.

United States—Maine. **Williams and Gregory.**

B. United States Geol. Surv. No. 165 (1900): pp. 212.

Contributions to the Geology of Maine. By Henry S. Williams and Herbert E. Gregory. *With Maps and Plates.*

United States—Mississippi River. **Derby.**

Rep. (U.S.) Chief of Engineers (1900): 4551-4556.

Changes in Flood Heights, Fourth District, Mississippi River. By Maj. G. McC. Derby.

This is an appendix to the Annual Report of the Mississippi River Commission. The author shows that, owing to an apparent increase in the carrying capacity of the river-bed, there has been a marked change in the heights reached by floods at certain points.

United States—Oregon, etc. **Laidlaw.**

Trade and Agriculture of the State of Oregon, &c., for the year 1900. Foreign Office, Annual No. 2666, 1901. Size 10 × 6, pp. 52. *Price* 3*d.*

CENTRAL AND SOUTH AMERICA.

Argentine Republic. ———

Annuaire statistique de la Ville de Buénos-Ayres. X^me^ Année. 1900. Buénos-Ayres, 1901. Size 10½ × 7, pp. xxxii. and 342.

Argentine Republic. *Rev. G.* **49** (1901): 229-238. **Daireaux.**

Découvertes géographiques dans la République Argentine à l'occasion du conflit chileno-argentin. Par Émile Daireaux. *With Map.*

The title is somewhat misleading, the paper being a general sketch of the progress of geographical knowledge in Argentina, and of the origin of the boundary question with Chili.

Argentine Republic. **Segui.**

Congreso Nacional. Investigacion Parlamentaria sobre Agricultura, Ganaderia, Industrias Derivadas y Colonización. Anexo B. Provincia de Buenos Aires. Informe del Comisario Sr. Ingeniero D. Francisco Segui. Buenos Aires, 1898. Size 10½ × 7, pp. xiv. and 458. *Map. Presented by Dr. F. P. Moreno.*

An exhaustive report on the resources of the province of Buenos Aires, and on the best means of developing them.

Argentine Republic—La Plata Estuary. **Herrmann.**

Ann. Hydrographie **29** (1901): 313-315.

Die Gezeitenverhältnisse in der La Plata-Mündung und ihr Einfluss auf die Bodengestaltung. Nach "Estudios sobre puertos en la provincia de Buenos Aires." Von J. Herrmann. *With Chart.*

Argentine Republic—Santa Fé. **Brandt and Pommerenke.**

República Argentina. La Provincia de Santa Fé en el principio del siglo XX. Compilado . . . por Ernesto Brandt y Guillermo Pommerenke. Rosario, 1901. Buenos Aires: Compañia Sud-Americana de Billetes de Banco, 1901. Size 7 × 10½, pp. 380. *Map and Illustrations. Presented by Dr. F. P. Moreno.*

A useful description, profusely illustrated by reproductions of photographs, of the present state of one of the most flourishing departments of the Argentine Republic. The subjects touched upon include political organization, education, communications, commerce, industries, agriculture, etc.

Barbados. **Greaves.**

Barbados. Report for 1900. Colonial Reports, Annual No. 326, 1901. Size 9½ × 6, pp. 26. *Price* 2*d.*

Bolivia.

Bolivia, its Position, Products, and Prospects. London: Printed for Private Circulation, 1901. Size 8½ × 5¼, pp. 20. *Map.*

Written with a view to calling attention to the great commercial resources of Bolivia. The author's name does not appear, but the map is compiled by J. L. Moreno, of the Bolivian army.

Brazil—Birds. **Goeldi.**

Museu Paraense de Historia Natural e Ethnographia. Album de Aves Amazonicas organisado pelo Dr. Emilio A. Goeldi, Director do Museu Paraense. Supplemento Illustrativo a obra "Aves do Brazil," pelo Dr. Emilio A. Goeldi. 1900. Size 12 × 9½. *Plates.*

This is the first instalment of a supplement to Dr. Goeldi's great work on the Birds of Brazil, published between 1894 and 1900. There are twelve sheets, each giving coloured illustrations of birds grouped according to the natural orders, and shown in their natural environment.

Colombia. **McDougall.**

Trade of Barranquilla for the year 1900. Foreign Office, Annual No. 2660, 1901. Size 10 × 6, pp. 12. *Price* 1*d.*

The recent disturbances have had a very detrimental effect on trade.

Colombia. **Uribe.**

Anales Diplomaticos y Consulares de Colombia. Publicados bajo la dirección de Antonio Jose Uribe. Tomo Primero. Bogota, 1901. Size 9½ × 6½, pp. 648 and lxxxiv.

Contains a detailed review of the boundary questions with Venezuela and Costa Rica.

Costa Rica. **Harrison.**

Trade of Costa Rica for the year 1900. Foreign Office, Annual No. 2661, 1901. Size 10 × 6, pp. 14. *Price* 1*d.*

Costa Rica. *La G., B.S.G. Paris* **3** (1901): 499–506. **Hulot.**

Une Mission française dans le Nord du Costa Rica. Par le Baron Hulot. *Map.*

On an expedition in 1898–99 under M. Jules Second.

Dutch Guiana. **Pigott.**

Trade of Dutch Guiana for the year 1900. Foreign Office, Annual No. 2656, 1901. Size 9½ × 6, pp. 12. *Price* 1*d.*

Haiti. *Petermanns M.* **47** (1901): 169–178. **Tippenhauer.**

Beiträge zur Geologie Haïtis. Von L. Gentil Tippenhauer. V. Das La Selle-Gebirge, die Cul-de-Sac-Ebene und das Salzseengebiet. *With Maps.*

Peru. **St. John.**

Trade and Finances of Peru for the years 1899–1900. Foreign Office, Annual No. 2639, 1901. Size 10 × 6, pp. 48. *Price* 2½*d.*

Peru and Chile.

Peru and Chili. Circular of the Peruvian Foreign Office on the Arica and Tacna Question. London, 1901. Size 9½ × 6, pp. 40.

Porto Rico. **Churchward.**

Trade of Porto Rico for the year 1900. Foreign Office, Annual No. 2647, 1901. Size 9½ × 6, pp. 18. *Price* 1½*d.*

The recent improvement in trade is entirely to the advantage of the United States. Various enterprises for the development of the island have been projected, but are hanging fire for want of capital.

St. Christopher. *B. American G.S.* **33** (1901): 207–219. **Alexander.**

The Flora of Saint Christopher. By W. H. Alexander.

Venezuela. **Lemos.**

Trade of Ciudad Bolivar for the year 1900. Foreign Office, Annual No. 2633, 1901. Size 9½ × 6, pp. 8. *Price* ½*d.*

West Indies—British Islands. *J.R. Colonial I.* **32** (1901): 509–537. **Walker.**

Impressions of the British West Indies. By Henry de R. Walker.

West Indies—Bush Fires. *West Indian B.* **2** (1901): 79–96. **Nicholls.**

Agricultural Conference, 1901. Legislation to Control Bush Fires. By H. A. Alford Nicholls, C.M.G., etc.

West Indies—Rubber. *West Indian B.* **2** (1901): 100–113. **Hart.**

Rubber Cultivation in the West Indies. By J. H. Hart, F.L.S. *Illustrations.*

AUSTRALASIA AND PACIFIC ISLANDS.

Australia. *Rev. G.* **49** (1901): 239–264, 322–336. **Maistre.**

L'Australie; origine et constitution de la Commonwealth. Par Paul Maistre. *With Map.*

Caroline Islands. **Friedrichsen.**

Jahresb. Frankfurter V.G. u. Statistik **64** *and* **65** (1899–1901): 163–166.

Die Karolinen. Von Dr. Max Friedrichsen.

German New Guinea. **Hesse-Wartegg.**

Jahresb. Frankfurter V.G. u. Statistik **64** *and* **65** (1899–1901): 159–160.

Durch unbekannte Gebiete im Bismarck-Archipel. Von Hesse-Wartegg.

German New Guinea. *Globus* **79** (1901): 256. **Parkinson.**

Die Insel St. Matthias (Bismarck-Archipel). Von R. Parkinson. *With Map.*

Hawaii—Birds. **Bryan.**

Key to the Birds of the Hawaiian Group. By William Alanson Bryan. Honolulu: Bishop Museum Press, 1901. Size 12 × 10, pp. 76. *Plates.*

Marshall Islands. *Rep. Smithsonian I.* (1899): 487–508. **Winkler.**

On Sea Charts formerly used in the Marshall Islands, with notices on the Navigation of these islanders in general. By Captain Winkler. *With Illustrations.*

Translated from the *Marine Rundschau*, Berlin, 1898.

New Hebrides. *Miss. Catholiques* **33** (1901): 309, 315, 332, 346, 355. **Deniau.**

Croyances Religieuses et Moeurs des Indigenes de l'Ile Malo (Nouvelles-Hébrides). Par le R. P. Alfred Deniau.

New South Wales. **Pittmann.**

Geological Survey of New South Wales. The Mineral Resources of New South Wales. By Edward F. Pittmann. Sydney, 1901. Size 8½ × 5½, pp. viii. and 488. *Map and Illustrations. Presented by the Agent-General for New South Wales.*

New Zealand. **Loughnan.**

New Zealand: notes on its Geography, Statistics, Land System, Scenery, Sport, and the Maori Race. By R. A. Loughnan. Wellington, N.Z., 1901. Size 6 × 10, pp. 110. *With Maps and Illustrations. Presented by the Minister for Lands, Department of Lands and Survey, Wellington, N.Z.*

Niué Island. *J. Anthrop. I.* **31** (1901): 137–145. **Thomson.**

Note upon the Natives of Savage island, or Niué. By Basil Thomson.

Queensland. **Dunstan.**

Queensland Gov. Mining J. **2** (1901): 118–122, 162–170, 212–216.

Geology of the Dawson and Mackenzie Rivers. With Special Reference to the occurrence of Anthracitic Coal. Report by Mr. B. Dunstan. *With Diagrams.*

Western Australia. ———

Glasgow International Exhibition, 1901. Illustrated Handbook of Western Australia. Perth, W.A., 1901. Size 8½ × 5½, pp. viii. and 178. *Map, Plan, and Illustrations.*

POLAR REGIONS.

Antarctic. **Shipley.**

The Abyssal Fauna of the Antarctic Region. By Arthur E. Shipley. (Reprinted from the 'Antarctic Manual,' 1901, chapter xviii. pp. 241–275.) Size 9 × 6, pp. 35. London, 1901.

Antarctic—Belgian Expedition. *Tour du Monde* **7** (1901): 313–408. **Gerlache.**

Quinze Mois dans l'Antarctique (Le premier Hivernage dans la Banquise australe). Par M. Adrien de Gerlache. *With Maps and Illustrations.*

Antarctic—Climate. *Globus* **80** (1901): 72–75. **Neger.**

Welche Eigentümlichkeiten in der heutigen Verteilung der Pflanzen lassen auf eine ehemalige Bewohnbarkeit der Antarktis schliessen? Von Dr. F. W. Neger.

Antarctic—German Expedition. *Scottish G. Mag.* **17** (1901): 461–467. **Bruce.**

The German South Polar Expedition. By William S. Bruce. *With Portrait.*

Arctic. *Ann. Hydrographie* **29** (1901): 414–425. **Bauendahl.**

Aus den wissenschaftlichen Ergebnissen der Polarfahrt des "Matador" unter Führung des Kapt.-Leut. a. D. Oskar Bauendahl, Herbst und Winter 1900–1901. *With Sketch-maps.*

This will be specially noticed.

Arctic. **Nathorst.**

Två Somrar i Norra Ishafvet, Kung Karls Land, Spetsbergens Kringsegling, Spanande efter Andrée i Nordöstra Grönland. Af A. G. Nathorst. 2 vols. Stockholm: Beijers Bokförlagsaktiebolag, 1900. Size 9½ × 6½, pp. (vol. i.) xxxvi. and 352, (vol. ii.) xiv. and 414. *Maps and Illustrations. Presented by the Author.*

This will be reviewed in the next number of the *Journal*.

Arctic—Baffinland. **Bell.**

A Survey in Baffinland, with a short description of the Country. By Robert Bell, M.D., etc. (From the *Geographical Journal* for July, 1901.) Size 10 × 6½, pp. 22. *Map and Illustrations.*

Arctic—Peary's Expedition. *National G. Mag.* **12** (1901): 357–361. ———

Peary's Work in 1900 and 1901. *With Portraits.*

Franz Josef Land—Meteorology. **Baldwin.**

U.S. Department of Agriculture. Weather Bureau. Report of the Chief of the Weather Bureau, 1899–1900. Part vii. Meteorological Observations of the Second Wellman Expedition. By Evelyn B. Baldwin. Washington, 1901. Size 11½ × 9½, pp. 351–436.

MATHEMATICAL GEOGRAPHY.

Astronomy. ———

Independent Day-Numbers for the year 1903, as used at the Royal Observatory, Cape of Good Hope. London: Eyre & Spottiswoode, 1900. Size 9½ × 6, pp. 14.

Geodesy. *Atti R.A. Lincei, Rendiconti* **10** (1901): 35–39. **Pizzetti.**

Un principio fondamentale nello studio delle superficie di livello terrestri. Nota di Paolo Pizzetti.

Instrument—Sextant. *Nautical Mag.* **70** (1901): 561–565. **Law.**

A Short and Easy Method of Finding the Centring Error of a Sextant when at Sea. By Commander E. D. Law.

Maps. **Morrison.**

Maps: Their Uses and Construction. A Short Popular Treatise on the advantages and defects of Maps on various projections, followed by an outline of the principles involved in their construction. By G. James Morrison. London: Edward Stanford, 1901. Size 8 × 5½, pp. viii. and 110. *Diagrams. Presented by the Publisher.*

This is the subject of a special notice (*ante*, p. 528).

Motion of the Pole. *K.A.W. Amsterdam, P. Sec. Sci.* **3** (1901): 157–163. **Bakhuyzen.**

The motion of the Pole of the Earth according to the observations of the last years. By Dr. E. F. van de Sande Bakhuyzen.

Navigation. *Nautical Mag.* **70** (1901): 421–424. **Goodwin.**

The Mercator's Chart as an Ex-Meridian Table. By H. B. Goodwin, M.A.

Navigation. **Moore.**

The Law relating to Charts and Sailing Directions. By H. Stuart Moore. London: J. D. Potter, 1901. Size 9½ × 6½, pp. 8. *Presented by the Publisher.*

Illustrates the state of the law respecting the proper supply of charts to vessels by a statement of various cases which have come before the courts. A comparative table shows that the number of Admiralty charts printed rose from 272,115 in 1885 to 580,207 in 1900.

Time-determination. *Ann. Hydrographie* **29** (1901): 372–375. **Wirtz.**
Zeitbestimmung und Chronometerkontrole durch eine Höhendifferenz. Von Dr. Carl W. Wirtz.

PHYSICAL AND BIOLOGICAL GEOGRAPHY.

Agricultural zones. *G.Z.* **7** (1901): 271–281, 333–342. **Hettner.**
Die Landbauzonen der aussertropischen Länder. Nach den Untersuchungen Th. H. Engelbrecht's. Von Prof. Dr. Alfred Hettner.

Dr. Engelbrecht's original work was fully reviewed in vol. xv. of the *Journal* (p. 52).

Climate. *Q.J.R. Meteorolog. S.* **27** (1901): 169–184. **Mill.**
Climate and the Effects of Climate. By Dr. H. R. Mill. *With Illustrations.*

Cosmogony. *American J. Sci.* **12** (1901): 140–142. **Fisher.**
Mathematical Notes to Rival Theories of Cosmogony. By O. Fisher.

Earthquakes. *Geolog. Mag.* **8** (1901): 449–452. **Oldham.**
The Periodicity of Earthquakes. By R. D. Oldham.

Geological History. **Cohen and Raken.**
K.A.W. Amsterdam P. Sec. Sci. **3** (1901): 63–66.
The Solubility of calcium carbonate in sea-water. By Dr. Ernst Cohen and H. Raken.

Gives the results of an investigation undertaken in connection with Prof. Dubois's researches as to the age of the Earth (see next entry).

Geological History. *K.A.W. Amsterdam, P. Sec. Sci.* **3** (1901): 43–62, 116–130. **Dubois.**
The Amount of the Circulation of the Carbonate of Lime and the Age of the Earth. By Prof. Eug. Dubois.

Geology. *Geolog. Mag.* **8** (1901): 445–449. **Ackroyd.**
On the Circulation of Salt in its Relations to Geology. By William Ackroyd.

Geology. *B.S.G. Com. Havre* **18** (1901): 321–339. **Beaugrand.**
Les phénomènes géologiques actuels, au point de vue de la géographie. Par Ch. Beaugrand.

Meteorology. *Climate* (1901): 144–155. **Majevski.**
For and against the Influence of the Moon on the Life of the Earth and its Atmosphere. By Zdislaw Majewski.

A summary of the views of the chief writers on the subject. The author gives his verdict in favour of the supposed influence of the moon on the weather.

Meteorology. *Monthly Weather Rev.* **29** (1901): 152–159, 306–307. **Pockels.**
The theory of the formation of precipitation on mountain slopes. By Prof. F. Pockels.

A quantitive analysis of the laws which govern the movements and adiabatic cooling of air impinging on a mountain slope, leads the writer to the conclusion that there exists a zone of maximum precipitation on the windward slope, and that the inclination of the surface is of more importance in determining the quantity of precipitation than the absolute elevation. The article originally appeared in the *Ann. der Physik*, and is reproduced also in the *Meteorol. Zeitschrift* (1901, pp. 300–312).

Phyto-geography. *Die Natur* **50** (1901): 337–340. **Roth.**
Ueber die Vegetation der Gewässer. Von Dr. E. Roth.

Waves. *Nautical Mag.* **70** (1901): 429–442. **Allingham.**
Abnormal Seas. By William Allingham.

The bulk of the paper is taken up with instances of exceptionally high seas, which the writer attributes to the action of the wind rather than to submarine earthquakes.

Zoogeography. *Naturw. Wochenschrift* **16** (1901): 304–306. ——
Die Bipolarität in der Verbreitung der Meeresorganismen.
Based on an article in *Ymer* by Prof. H. Théel.

ANTHROPOGEOGRAPHY AND HISTORICAL GEOGRAPHY.

Commercial Geography. *Die Natur* **50** (1901): 231–234, 244–246, 256–258. **Messmer.**
Bitumen und Asphalt. Von Herm. Messmer.

Commercial Geography. ——

The World's Commerce and the United States' share of it. 1900. Philadelphia: Commercial Museum, 1901. Size 8½ × 4, pp. 20.

Commercial Geography—Gold. *J.R. Statistical S.* **64** (1901): 415–433. **Hooper.**

The Recent Gold Production of the World. By Wynnard Hooper.

Economic Geography. *G.Z.* **7** (1901): 425–434. **Losch.**

Einige Bemerkungen über Wirtschaftsstatistik, Wirtschaftsgeographie und Kartographische Darstellung. Von Dr. Hermann Losch.

Languages. **Cust.**

List of Literary Languages spoken and written in the Dominions of Her Majesty Queen Victoria at the close of the Nineteenth Century. By Robert Needham Cust, LL.D. Size 8 × 5½, pp. 16. Hertford, 1901.

Population. *Mém. Couronnés A.R. Belgique* **59** (1900): pp. 16. **Denis.**

Le mouvement de la population et ses conditions économiques. Par Hector Denis. *With Diagrams.*

Prince Henry the Navigator. **Mees.**

Henri le Navigateur et l'Académie Portugaise de Sagres. Par le Dr. Jules Mees. Bruxelles, 1901. Size 9 × 6, pp. [34]. *Presented by the Author.*

The author holds that the idea of a Geographical Academy founded at Sagres by Prince Henry, is based only on the statement of Duarte Pacheco Pereira, repeated by Barros, that the prince obtained the services of one Jacome of Majorca as cartographer.

The Earth and Man. *Ann. G.* **10** (1901): 97–114, 193–215 **Woeikof.**

De l'influence de l'homme sur la terre. Par Prof. A. Woeikof.

A clear summary of the various ways in which the natural features of the Earth are modified through the action of man.

Village types. *Globus* **79** (1901): 293–298, 318–323. **Buchwald.**

Der Ursprung des Rundlings. Von Dr. Gustav v. Buchwald. *With Maps.*

BIOGRAPHY.

Banning. *Annuaire A.R. Belgique* (1900): 81–152. **Brialmont.**

Notice sur Émile Banning. Par Général Brialmont. *With Portrait.*

Emile Banning took an important part in the movement for the acquisition of colonies by Belgium.

Bergman. **Lindquist.**

Framställning af Torbern Bergmans Fysiska Geografi. 1. Af John Lindquist. Stockholm, 1900. Size 9 × 6, pp. 112.

An analysis of the work published by Torbern Bergman in 1766, with a brief sketch of the author's life.

Bonney. *Geolog. Mag.* **8** (1901): 385–400. ——

Eminent Living Geologists. The Rev. Professor T. G. Bonney, D.Sc., etc. *With Portrait. Also separate copy, presented by Prof. Bonney.*

Chaix. *Le Globe, B.S.G. Genève* **40** (1901): 143–154. **Goegg, Gautier, Saussure.**

Le Professeur Paul Chaix, président honoraire de la Société de géographie de Genève. Discours de MM. E. Goegg, R. Gautier, H. de Saussure, lettre de la Société Neuchâteloise de Géographie.

Kubary. **Thiel.**

Betreffend "Kubary-Denkmal." Size 9 × 6, pp. 16. *Portrait.*

A circular in support of the proposed monument to J. S. Kubary on Ponape, where the well-known Polish traveller died in 1896. It contains a biography reprinted from the *Kolonialzeitung* for 1899.

Lapworth. *Geolog. Mag.* **8** (1901): 289–303. ——

Eminent Living Geologists. Professor C. Lapworth, LL.D., F.R.S., F.G.S. *With Portrait.*

Leue. *Deutsche Rundschau G.* **23** (1901): 521–522. ——

Hauptmann A. Leue. *With Portrait.*

Captain Leue has done good work as a pioneer in German East Africa.

GENERAL.

Bibliography. ———

International Catalogue of Scientific Literature, Instructions, Schedules, and Lists of Journals. Size 8½ × 5½.

The instructions for the use of those engaged in the compilation of the International Catalogue of Scientific Literature, of which the first set of volumes will deal with 1901, are printed in English, French, German, and Italian. The schedules giving the subdivisions of the various sciences, and the lists of journals to be dealt with, are also being issued. Each branch of science has a special index letter (a capital), and the subdivisions are denoted by numerals and small letters. Under geography, physical and mathematical (J), the Earth as a whole and its main subdivisions are represented by the letters from *a* to *o*, letters being again used in combination for the smaller divisions. Thus *d* stands for Europe, *de* for the British Isles. For the subject headings (mountains, valleys, cartography, etc., etc.) numerals are used. The classification is generally satisfactory except in the case of Africa, where we find such overlapping divisions as "West Africa from Morocco to the Congo;" "Sahara and French Sudan."

British Empire. **Jose.**

The Growth of the Empire. A Handbook to the History of Greater Britain. By Arthur W. Jose. London: John Murray, 1901. Size 8 × 5½, pp. xvi. and 422. *Maps. Price* 6*s. Presented by the Publisher.*

While supplying a useful summary of the historical facts connected with the growth of the British Empire, this work has a higher value through the endeavour which has been made to trace the principles at work throughout the course of that growth, and the lessons to be learnt for the future. The author shows a keen sense of the importance of the *rôle* to be played by the empire, and the corresponding responsibility resting with the British nation.

Census Results. *J.R. Statistical S.* **64** (1901): 493-526. **Baines.**

Census Notes. By J. A. Baines, C.S.I.

On the broad features brought out by recent censuses.

Education—Methods. *Scottish G. Mag.* **17** (1901): 393-399. **Reclus.**

The Teaching of Geography, Globes, Discs, and Reliefs. By M. Elisée Reclus.

Educational. **Heiderich.**

Oesterreichische Schulgeographie. Erster Theil: Für die I., II., und III. Classe der Mittelschulen. Von Franz Heiderich. Wien: Ed. Holzel, 1901. Size 9 × 6, pp. vi. and 304. *Plates. Presented by the Publisher.*

This is a well-arranged text-book for the use of middle-grade schools. It is divided into two sections, the first dealing with the broad principles of mathematical and physical geography, with a brief sketch of the main characteristics of the several continents. The second, intended for higher classes, describes the principal laws of climatology, but is in the main devoted to a study in detail of regional geography. There is a good series of illustrations, showing the main types of surface, etc.

French Colonies. **Zimmermann.**

Die Europäischen Kolonien, Vierter Band. Die Kolonialpolitik Frankreichs. Von den Anfängen bis zur Gegenwart. Von Dr. Alfred Zimmermann. Berlin: E. S. Mittler und Sohn, 1901. Size 9½ × 6, pp. xiv. and 438.

A valuable historical sketch of French colonization from its first beginnings in the fourteenth century. Incidentally it deals likewise with early French exploration, especially in North America.

Geographical Congress. *Rev. G. Italiana* **8** (1901): 217-244, 304-336, 409-419. ———

Il Quarto Congresso Geografico Italiano.

Geographical Congress. *National G. Mag.* **12** (1901): 351-357. ———

Next International Geographical Congress to be held in Washington. *With Portraits.*

Contains a sketch of the past history of the Congress, and some suggestions respecting the programme of the Washington meeting.

Geographical Errors. *B. American G.S.* **33** (1901): 259-264. **Gannett.**

Certain Persistent Errors in Geography. By Henry Gannett.

Mr. Gannett classes as errors a certain number of ideas about which expert opinion is, to say the least, divided, *e.g.* the effect of forests, not only on rainfall, but on the flow

of water in rivers. Again, while denying the effects on climate usually attributed to ocean currents, he assigns to these a preponderating *rôle* in the equalization of the temperature of the ocean. The comparative warmth of the latter in high latitudes, and the resulting effect on climate, is therefore, on his own showing, ultimately due to the movement of the warmer water towards the poles.

Geographical Progress. *B.S.G. Italiana* **2** (1901): 615–636. **Vedova.**

I progressi della Geografia nel Secolo XIX., discorso del Prof. G. Dalla Vedova.

German Colonies. *Rev. G.* **49** (1901): 13–26, 124–135. **Brisse.**

Le développement colonial allemand. Par André Brisse. *With Map.*

Library Catalogue. **Boosé.**

First Supplementary Catalogue of the Library of the Royal Colonial Institute. Compiled by James R. Boosé, Librarian. London: Published by the Institute, 1901. Size 11 × 7½, pp. cclxxviii. and 794. *Presented by the Institute.*

The great growth of the library of the Royal Colonial Institute during the last seven years, owing to the endeavour which has been made to obtain all the earlier published works bearing on the discovery, acquisition and settlement of the British colonies, has necessitated the issue of a supplement nearly double the size of the original catalogue. The work will prove most valuable from a bibliographical point of view, as well as a guide to the contents of the Colonial Institute library. It is to be regretted that, as the entries are classified almost entirely under the headings of the various British possessions, many works referring to other colonies are incorrectly placed in the catalogue.

Library Catalogue.

Colonial Museum and Geological Survey of New Zealand. Catalogue of the Colonial Museum Library. Second Edition. Wellington, 1900. Size 9½ × 6, pp. 156. *Presented by the Colonial Museum.*

Nomenclature. *Rev. G. Italiana* **8** (1901): 369–374. **Ricchieri.**

Toponomastica e Nomenclatura Topografica Dialettale. Prof. Giuseppe Ricchieri.

NEW MAPS.

By E. A. REEVES, *Map Curator*, R.G.S.

EUROPE.

England and Wales. **Ordnance Survey.**

Ordnance Survey of England and Wales: Revised sheets published by the Director-General of the Ordnance Survey, Southampton, from October 1 to 31, 1901.

1-inch:—

With hills in brown or black: 87, 146, 163, 196 (engraved), 1*s. each*. Printed in colours: 170, 176, 180, 1*s. each*.

6-inch—County Maps:—

Bedfordshire, 6 N.E., 24 N.E. **Cumberland,** 6 S.E. **Derbyshire,** 52 N.E., 53 S.E. **Glamorganshire,** 6 N.E., S.E., 29 S.E., 38 N.W., 43A S.W. **Merionethshire,** 2 S.W., 6 S.W., S.E., 7 S.W., S.E., 9 S.W., 11 N.E., 12 N.W., 13 S.W., S.E., 14 N.E., S.E., 15 S.W., 16 N.W., S.W., 19 N.W., N.E., 20 N.W., S.W., 21 N.E., S.E., 22 N.W., N.E., S.W., S.E., 23 N.W., N.E., S.W., S.E., 25 N.E., S.E., 26 N.W., S.E., 27 N.W., N.E., S.W., S.E., 28 N.W., N.E., S.E., 29 S.W., S.E., 30 N.W., 31 N.E., 32 N.E., S.E., 33 N.W., 34 N.W., 35 N.W., S.W., 38 N.W., 40 S.E., 41 N.E. **Monmouthshire,** 10 N.E., S.E., 18 N.E., 27 S.E., 33 N.W., 38 S.W. **Montgomeryshire,** 1 S.W., S.E., 3 S.E., 4 N.W., 7 N.W. **Northamptonshire,** 47 N.W. **Nottinghamshire,** 42 N.W. **Staffordshire,** 23 S.W., 24 N.W., S.W., 25 N.E., S.W., 29 S.E., 30 N.E., S.E., 31 N.E., S.E., 32 N.W., N.E., 33 S.E., 38 N.E. **Wiltshire,** 44 N.E., 51 S.E., 52 S.W., 58 N.E., 64 S.E., 65 N.E., 67 S.W., S.E., 71 S.W., 76 N.E. 1*s. each*.

25-inch—County Maps:—

Cambridgeshire, X. 3, 4, 6, 7, 8, 9, 10, 14, 16; XI. 1, 9; XIV. 1, 5, 6, 7, 10, 11, 12, 15, 16; XIX. 3, 4; XXXII. 10, 11, 13, 14, 15; XXXVIII. 1, 2, 5, 6, 9, 10. **Derbyshire,** LIX. 14; LX. 2, 6, 7, 10; LXII. 2, 3, 12; LXIII. 5, 6, 7, 10. **Dorsetshire,** III. 2, 3, 5, 6, 7; IV. 9, 13, 14; VIII. 1, 3, 6, 9, 10, 14; X. 14, 15; XIV. 2, 5, 6,

7, 8, 9, 10, 11, 12, 13, 14, 15, 16; XV. 10, 11, 12, 13, 14, 15, 16; XVI. 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; XVII. 1, 5, 9; XXIV. 2, 3, 4, 6, 8, 10, 11, 12, 14, 15, 16; XXV. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; XXVI. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; XXXIII. 7; XXXIV. 1, 2; XXXV. 1, 2, 3, 4, 5, 6, 7. **Huntingdonshire,** II. 10, 13, 14, 15; V. 3; VI. 1, 5, 6, 10, 11, 15, 16; X. 2, 3, 4, 8, 9, 11, 12, 15, 16; XIV. 4, 6, 7, 8, 12, 14, 15, 16; XVIII. 2, 4, 8, 9, 11, 12, 13, 14, 15, 16; XX. 15, 16; XXI. 4; XXII. 1, 2, 4, 10, 11, 12, 13, 14, 15; XXIV. 4, 8, 12; XXV. 6, 11, 15; XXVI. 1, 2, 5, 6, 9, 10; XXVII. 3, 7, 8; XXVIII. 5. **Monmouthshire,** VIII. 16; IX. 9, 10, 14; XII. 1; XIV. 4, 12, 14, 16; XX. 4, 7, 11, 16; XXII. 8; XXV. 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16; XXVIII. 12, 15; XXIX. 9; XXX. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13; XXXIII. 8; XXXIV. 5 (15 and 16). **Montgomeryshire,** X. 4; XI. 1, 10; XIII. 16; XIV. 13, 14, 15; XIX. 16; XX. 14, 16; XXI. 4, 13, 14, 15; XXII. 1, 2, 3; XXVI. 4, 7; XXVII. 3, 4, 8; XXVIII. 2, 5, 6, 10. **Shropshire,** VI. 8, 11, 12, 14, 15, 16; VII. 13; IX. 10; XIII. 2, 3, 4, 6, 7, 8, 10, 11, 12, 14, 15, 16; XIV. 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12; XV. 1, 5; XIX. 10, 11, 12, 14, 15, 16; XX. 2, 9, 10, 11, 12, 14, 16; XXV. 4; XXVI. 1, 2, 7, 8, 10, 12; XXVII. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12; XXVIII. 1, 2, 5, 6, 10. **Staffordshire,** XXXVII. 15; XLVII. 1, 2, 14; LIII. 2, 3, 12; LIV. 5, 10. *3s. each.*

4 miles to 1 inch:—

Salisbury Plain, with roads printed in colour, *9d.*, folded in cover.

(***E. Stanford, London Agent.***)

France. **Sullivan-Alexander.**

Map showing Consumption of French and Foreign Coal in 1899. Designed and executed by Henry Sullivan-Alexander. Issued by the American Coal and Shipping Agency, Paris. *Presented by Henry Sullivan-Alexander, Esq.*

Four maps on one sheet, showing by a system of colour-tinting and figures, the relative quantities of French, British, Belgian, and German coal consumed in the various departments of France during the year 1899. Additional information is also given in tabular form, concerning the annual consumption of coal in the United Kingdom, Belgium, Germany, the United States, and Algeria.

Germany. **Konigl. Preuss. Landes-Aufnahme.**

Karte des Deutschen Reiches. Scale 1 : 100,000 or 1·6 stat. mile to an inch. Sheets: 144, Osten; 208, Rotenburg; 235, Verden; 236, Walsrode; 261, Neustadt. Herausgegeben von der Kartogr. Abtheilung der Konigl. Preuss. Landes-Aufnahme, 1901. *Price* 1.50 *mark each sheet.*

Germany. **Langhans.**

Die Wassererwerbs-Bevölkerung in Deutschen Reich. Anteil der Binnenschiffahrts-Bevölkerung des Deutschen Reichs an der Gesamtbevölkerung der kleinen Verwaltungsbezirke. Nach der Berufszählung von 1895.—Anteil der Schiffsbau-Bevölkerung an der Gesamtbevölkerung an der mittleren Elbe und Oder.—Schiffsbau-Bevölkerung.—Reederei-Bevölkerung. Scale 1 : 3,750,000 or 59·2 stat. miles to an inch.—Die Wassererwerbs-Bevölkerung im Verhältnis zur Gesamtbevölkerung des Deutschen Reichs. Scale 1 : 7,000,000 or 115 stat. miles to an inch. *Petermanns Geographische Mitteilungen*, Jahrgang 1901, Tafel 17. Gotha: J. Perthes. *Presented by the Publisher.*

Lapland. **Petermanns Geographische Mitteilungen.**

Uebersichtskarte der Niederlassungen an der Murman-Küste. Scale 1 : 2,000,000 or 31·6 stat. miles to an inch.—Uebersicht des Katharinen-Hafens. Scale 1 : 30,000 or 0·5 stat. mile to an inch.—Die Niederlassungen am Katherinen Hafen. Scale 1 : 20,000 or 0·3 stat. mile to an inch.—Skizze der projektierten Nordbahn. Scale 1 : 20,000,000 or 316 stat miles to an inch. *Petermanns Geographische Mitteilungen*, Jahrgang 1899, Tafel 9. Gotha: J. Perthes. *Presented by the Publisher.*

Russia. **Shevelevuim.**

Map of European Russia and Siberia. Scale 1 : 3,000,000 or 47·4 stat. miles to an inch. A. Shevelevuim. St. Petersburg, 1901. 4 sheets.

In addition to the general map of European Russia, which shows railways constructed and projected, there is an inset of Asiatic Russia, showing the Trans-Caspian and the Trans-Siberian railways. There are also several insets of plans of cities and towns, and their immediate surroundings.

ASIA.

China. **Bureau Topographique des Troupes de l'Indo-Chine.**

Carte de l'Indo-Chine. Scale 1 : 200,000 or 3·1 stat. miles to an inch. Sheets: "Muong Sing," "Dien-Bien-Phu," "Khanh-Hoa," "Xieng-Khouang," "Muong Lan," "Vien Poukha," "Vinh-Long," "My-Tho," "Vinh," "Thanh Hoa," "Hue," "Quang Tri," "Ha Ting," "Bongson," "Tourane," "Muong-Hou-Neua," "Mong-Tze," "Lai-Chau," "Lao-Kay," "Cao-Bang," "Long-Tcheou," "Kai-Hoa," "Yen-Minh," "Yen-Bay," "Thai-Nguyen," "Lang Son," "Pak-Hoi," "Muong Son," "Muong Het," "Hanoi," "Luang-Prabang," "Saigon." Bureau Topographique des Troupes de l'Indo-Chine.

The thirty-two sheets mentioned above form part of a large map of Indo-China, which is now in course of publication, and are compiled principally from the route surveys of French officers. When complete the map will include the whole of Tongking, Annam, Cambodia, and Cochin China, as well as the neighbouring portions of Siam and China; but at the present time the sheets that have been issued comprise only Tongking, the coast of Annam, and a part of Cochin China. Many blank spaces occur, and much of the detail that is given is evidently of a doubtful character, owing to the want of reliable information. The graduation of the sheets is on the metric system. The map is a somewhat rough production, printed in colours, and it is apparent that it is only to be considered as provisional.

China. **Konigl. Preuss. Landes-Aufnahme.**

Karte von Ost-China. Scale 1 : 1,000,000 or 15·8 stat. miles to an inch. Kartographische Abtheilung der Konigl. Preuss. Landes-Aufnahme, 1901. Sheets: "Nanking" and "Hankau," "Peking," "Tsi-nan-fu," "Tsing-tan," "Mukden."

Each of these sheets includes four degrees of latitude and six degrees of longitude. There is not at the present time sufficient information available to make anything like a complete map of China on so large a scale as 1 : 1,000,000; and in districts away from beaten tracks, no great confidence can be placed upon the details given on these sheets. It would perhaps have been better if parts that are merely sketched in from doubtful sources had been clearly distinguished from others that may be considered fairly accurate. Sheets "Nanking" and "Hankau" are chiefly from unpublished material furnished by Baron Ferd. v. Richthofen. A comparison of this map with that of the French government map now being published, and on the same scale, shows discrepancies and differences, some of which are considerable.

China. **Madrolle.**

Atlas de l'Empire Chinois. Par Cl. Madrolle. Scale 1 : 1,000,000 or 15·8 stat. miles to an inch. Sheet: "Tchao-Tong." Millet, Paris.

This sheet includes portions of the frontier region of Sechuan and Yunnan between lat. 26° 6′ and 28° 38′ N., and long. 100° 53′ and 104° 31′ E. of Greenwich. No hill-work is shown. Rivers, their names, the names of travellers, altitudes in metres, and the location of minerals, are given in blue, while names of places and travellers' routes are shown in black. In a region so mountainous as this, to publish a map with no indication of the mountains seems somewhat remarkable, though of course it is a considerable saving in expense.

AFRICA.

Congo Free State. **Droogmans.**

Carte du Bas Congo. Scale 1 : 100,000 or 1·6 stat. mile to an inch. Par H. Droogmans. Bruxelles: A. de Schaepmeester, 1900. *With Text.* 15 *Sheets.*

This map includes the course of the lower Congo, and the portion of the Congo Free State lying between Stanley Pool and the coast. It is based upon seventy positions which have been astronomically determined, and which are indicated upon the map by a special symbol. The right bank of the river from Banana to Ponta da Lehna, with the creeks, is drawn according to a chart by M. Sterpin; the course of the river between Malela and Boma is from the recent surveys of Commander Purey-Cust, R.N., while in the neighbourhood of Boma the triangulation of M. Mahieu has been utilized. The details given in the charts and sketches furnished by Stanley, Baumann, and Dupont have served for the drawing of the river in the neighbourhood of the cataracts. Stanley Pool is according to Stanley's delineation, with certain alterations and corrections by Delporte and others. The railway between Matadi and Stanley Pool is reduced from a large plan of the Campagnie du Chemin de Fer du Congo. These are only some of the sources from which this map has been compiled; a complete

list of all the authorities consulted is given in the volume of letterpress which accompanies the map, and which also gives a description of the area included in each sheet.

Although somewhat rough in appearance, the map is clearly drawn, and tinted in black and white. Altitudes are shown in metres, and in addition to the ordinary graduation, giving latitude and longitude (the latter from Greenwich), scales are given round the border of each sheet showing distances in kilometres south of the equator and east of the meridian of 20° E. long. from Greenwich. The object of this latter arrangement is to facilitate the computation of the distance between any two places on the map, which can of course be found, when the difference in kilometres in the two directions east and west and north and south is known, by the formula $AB = \sqrt{AC^2 + BC^2}$, where AC is base, and BC the perpendicular of a right-angled triangle, of which the required distance is the hypotenuse AB. This would doubtless give the distance between two places near enough, as the area covered by the map includes only a few degrees of latitude and longitude; but unless the places are a considerable distance apart, and are on different sheets, it is questionable if many persons would put themselves to the trouble of going through this computation when they can measure the distance directly from a scale in the ordinary way.

Portuguese East Africa. **d'Andrade.**

Carta da Região Mineira de Manica. Scale 1 : 50,000 or 0·8 stat. mile to an inch. Levantada sob a Direcção do Capitão d'Engenharia Alfredo Augusto Freire d'Andrade. Reduzida e Coordenada por José Gonzalez del Valle, e E. Raimundo Gonzalez del Valle. Publicado com auctorisação da Companhia de Moçambique, 1900. Erhard Frères, Paris. *Price* £1.

Since the final demarcation of the boundary-line between the British and Portuguese territories in South-East Africa in 1898, the Portuguese have completed a survey of Manica, the results of which are published on this map. It shows the country around Massi Kessi and the railway from that place to the British frontier. Contour-lines are given in brown at intervals of 20 metres, in addition to which the relief is indicated by shading. Mining claims are coloured in red, and a number is affixed to each. These numbers are again given in a table in a corner of the map, with the corresponding names of the property.

South Africa. **Johnston.**

Map of South Africa. Scale 1 : 1,357,280 or 23 stat. miles to an inch. W. & A. K. Johnston: London & Edinburgh, 1901. 2 sheets. *Presented by the Publishers.*

A wall map of South Africa evidently intended for educational purposes. The colouring of the political divisions and boundaries to a great extent obscures the physical features of the country, as is often the case with maps of this kind. This is to be regretted, as it would have proved far more instructive if the general relief and leading physical characteristics had been more clearly brought out. Names of places of importance in connection with the war, and some sites of battles, are indicated.

Uganda. **Petermanns Geographische Mitteilungen.**

Karte des Uganda-Protektorats. Nach den neuesten amtlichen Quellen. Scale 1 : 4,000,000 or 63 stat. miles to an inch. *Petermanns Geographische Mitteilungen.* Jahrgang 1901, Tafel 18. Gotha: J. Perthes. *Presented by the Publisher.*

AMERICA.

Alaska. **Carlsen.**

Map of Cape Nome and adjacent mining districts. Scale 1 : 145,728 or 2·3 stat. miles to an inch. By E. Carlsen. Seattle, Washington: The O.P. Anderson Map & Blue Print Co. *Price 50 cents. Presented by H. T. Burls, Esq.*

This is a blue print showing the mining districts of the neighbourhood of Cape Nome.

Alaska. **Kemp and Kingsbury.**

Map of Cape Nome and Golovin Bay, and Cape York Mining districts. Scale 1 : 760,320 or 12 stat. miles to an inch. By Charles Kemp and A. G. Kingsbury. Seattle, Washington: Lowman and Hanford Stationary & Printing Co., 1900. *Presented by H. T. Burls, Esq.*

Gives also, as insets, geological sections, and plans of the El Dorado mining district, Nome city and vicinity.

Haïti. **Tippenhauer.**

Topographische und geologische Karte eines Teils der Republik Haïti zwischen Gonaïves, Grande Rivière und Maïssade. Scale 1 : 100,000 or 1·6 stat. mile to an

inch.—Tafel der verschiedenen Stellen des Zutagetutens eines Lignitlagers in der Gegend zwischen den Flüssen Piedre und Canot und der Kommune Maïssade. —Topographische und geologische Karte des Morne de la Selle, der Cul-de-Sac-Ebene und des Salzseengebietes, Insel Haïti. Scale 1 : 100,000 or 1·6 stat. mile to an inch. *Petermanns Geographische Mitteilungen*, Jahrgang 1901, Tafels 12 und 13. Gotha : J. Perthes, 1901. *Presented by the Publisher.*

A continuation of the important series of maps showing the geology of the island of Haïti, which have recently appeared in *Petermanns Geographische Mitteilungen*, with valuable papers by the same author.

North America. **Stanford.**

Map of the United States, showing the principal United States and Canadian Railways quoted in the Daily Stock Exchange lists. Scale 1 : 5,274,720 or 83·25 stat. miles to an inch. E. Stanford : London, 1901.

AUSTRALASIA.

British New Guinea. **Survey Department, Brisbane.**

Map of British New Guinea. Scale 1 : 2,027,520 or 32 stat. miles to an inch. Survey Department, Brisbane, Queensland, 1900.

The surveys of Sir William Macgregor and others have been made use of in the compilation of this map. Insets of Port Moresby and Samarai (Dinner island) are given on enlarged scales, and steamer routes to neighbouring islands and ports in Queensland, with the distances, are laid down. The map is on a small scale, and the photo-lithography process by which it has been produced has not proved very successful, many of the names being very indistinct.

GENERAL.

Telegraph Lines. **Bureau International des Administrations Télégraphiques.**

Carte Générale des Grandes Communications Télégraphiques du Monde. Dressée d'après des documents officiels par le Bureau International des Administrations Télégraphiques. Berne, 1901.

CHARTS.

North Atlantic Ocean and Mediterranean Sea. **Meteorological Office, London.**

Monthly Pilot Chart of the North Atlantic Ocean and Mediterranean Sea for September and November, 1901. London Meteorological Office. *Price* 6*d. Presented by the Meteorological Office.*

U.S. Charts. **U.S. Hydrographic Office.**

Pilot Chart of the North Atlantic Ocean for October and November, and North Pacific Ocean for November 1901. U.S. Hydrographic Office, Washington, D.C. *Presented by the U.S. Hydrographic Office.*

PHOTOGRAPHS.

Abyssinia. **Gwynn.**

Eighteen Photographs of Abyssinia, by Major C. W. Gwynn, D.S.O., R.E. *Presented by Major C. W. Gwynn, D.S.O., R.E.*

These photographs form part of the series presented by Major Gwynn some time ago, and which were noticed in the *Geographical Journal* for August last. The following is a list of their titles :—

(1) Eisa Somali camels ; (2–4) Somali war-dance (Eisas) ; (5) St. Raguel's church, Entotto ; (6) Clock-tower and palace, Addis Abbaba ; (7) Gibe (palace), Addis Abbaba ; (8) Audience chamber, palace, Addis Abbaba ; (9) British Residency, Addis Abbaba ; (10) Fuel stores, palace, Addis Abbaba ; (11) Dining-hall, palace, Addis Abbaba ; (12–14) Donakils at Ewer Gota, Hawash valley ; (15) Gunz village, J. Matongwe : (16) River Dinder between Dunkar and Abu Ramla ; (17) J. Matongwe, near Abu Ramla, showing Gunz village on top ; (18) Abyssinian officer.

Venezuela, Trinidad, Port Darwin.

Twenty Photographs of the Caratal District, Venezuela, by T. F. Gomez Burke, 1884–85.—Three Photographs taken in Trinidad, West Indies, 1885.—Five Photographs of Port Darwin, by J. M. Neilson. *Presented by H. G. Slade, Esq.*

Some of these photographs have an interest from a historical point of view, especially those representing the mining operations in the long-disputed territory of Guiana,

which has now been given to Venezuela by the British Guiana and Venezuela Boundary Arbitration.

Venezuela.—(1) Prisoners making "Camino del Pinâte;" (2) General view from Potosi hill; (3) Chile village; (4) Main shute and new road; (5) Cincero from east; (6-8) Water-shaft; (9) Group at Cincero house; (10) Chile mill; (11) Back of mill; (12) Engine-room; (13) No. 5 shaft; (14) Tanks; (15) Chile house and store; (16) General view of village Chile from Pen Jolai hill; (17) General view in Caratal; (18) Mountains of Guiana beyond Caratal; (19, 20) No titles.

Trinidad.—(1-3) Hindu coolie women in gala array.

Port Darwin.—(1) Signal station; (2) A general view; (3) Entrance of harbour; (4) Harbour; (5) Landing jetty.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.

ORDNANCE SURVEY MAPS.

The following is a list of the various Ordnance Survey Maps of the British Isles on sale to the public, together with the prices. E. Stanford, 12, 13 and 14, Long Acre, W.C., is the London agent; there are also provincial agents in most of the important towns of England, Scotland, and Ireland. In places where no agent exists, the maps can be obtained through the principal local post offices.

1-inch Scale.

	Price per sheet. s.	d.
1. England and Wales, old series, in black, with outline and hill hachures.		
Size 36 × 24	½	6
Size 18 × 12	1	0
2. Ditto, outline, contours in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
3.*Ditto, hills hachured in brown, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
4.*Ditto, hills hachured in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
5.*Ditto, hills hachured in brown, contours red, roads brown, water blue, magnetic variation shown, latitude and longitude not marked. Size 18 × 12 inches. On linen-backed paper, either flat (with a few exceptions) or folded in covers. Single sheets	1	0
Combined sheets	1	6
6. Scotland, outline and contours in black, latitude and longitude marked. Size 24 × 18 inches. On paper	1	9
7.*Ditto, hills hachured in brown, and black contours, latitude and longitude marked. Size 24 × 18 inches. On paper	1	6
8. Ireland, outline, not contoured, in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
9. Ditto, hills hachured in black, latitude and longitude marked. Size 18 × 12 inches. On paper	1	0
10.*Combined maps of areas round certain large towns, or other areas, such as the New Forest and Lake District, and published in various forms and sizes. These maps usually show outline and contour in black and roads in brown. In sheets, unmounted	9*d.* to	1 0
Folded in cover	1*s.* to	1 6

* Publication in progress.

4 Miles to an Inch.

	Price per sheet. s.	d.
11. England and Wales, engraved in black, latitude and longitude marked, no hill shading or contours. Size 22½ × 15 inches. On paper . . .	1	6
12.*Scotland, engraved. Printed from a transfer from copper, with water in blue, latitude and longitude marked, no hill shading or contours. Size 18 × 12 inches. On paper	1	0
13.*County Map of Great Britain, cheap edition, roads in brown, latitude and longitude marked, on thin paper or folded in covers. Unmounted	0	6
Folded in covers	0	9

6-Inch Scale.

14. Great Britain, water coloured blue or back lined, contours in black, latitude and longitude marked. Heliozincographed and photozincographed. Size 18 × 12 inches .	1	0
Engraved or photozincographed (where not published in quarter sheets). Size 36 × 24 inches	2	6
15. Ireland, engraved or heliozincographed, contours in black, latitude and longitude not marked. Size 36 × 24 inches	2	6

1/2500 Scale.

16. Houses ruled in black, water blue or back lined, latitude and longitude not marked. Size 38 × 25½ inches	3	0
17. Houses red, water blue, roads brown, latitude and longitude not marked. Unrevised editions only coloured in this form. Size 38 × 25½ inches. From 2s. 6d. to 23s., according to the amount of colouring. This form is gradually being superseded by 15.		

Town Scales.

18. 1/500 scale, houses stippled. Size 38 × 25½	2	6
19. Ditto, houses ruled. Size 38 × 25½	2	6
20. Ditto, houses red, water blue, roads brown. Size 38 × 25½ inches. From 2s. 6d. to 15s., according to the amount of colouring. Applies to unrevised only.		
21. 5-feet scale, houses stippled. Revised. Size 36 × 24 inches	2	6

Index Maps.

22. Indexes to the sheets of the 1-inch scale maps of England and Wales, Scotland, and Ireland, scale 30 miles to an inch. Sizes about 18 × 13 inches	0	2
23.*Index to the sheets of the 6-inch scale map, parishes coloured. England and Wales. Size 18 × 12 inches	1	0
Scotland. Size 24 × 18 inches	1	9
24.*Index to the sheets of the 1 : 2500 scale map, parishes coloured. England and Wales. Size 18 × 12 inches	1	0
Scotland. Size 24 × 18 inches	1	9

Nos. 23 and 24 are identical with Nos. 2 and 6, but with sheet lines added, printed on thin paper, and coloured to show civil parishes.

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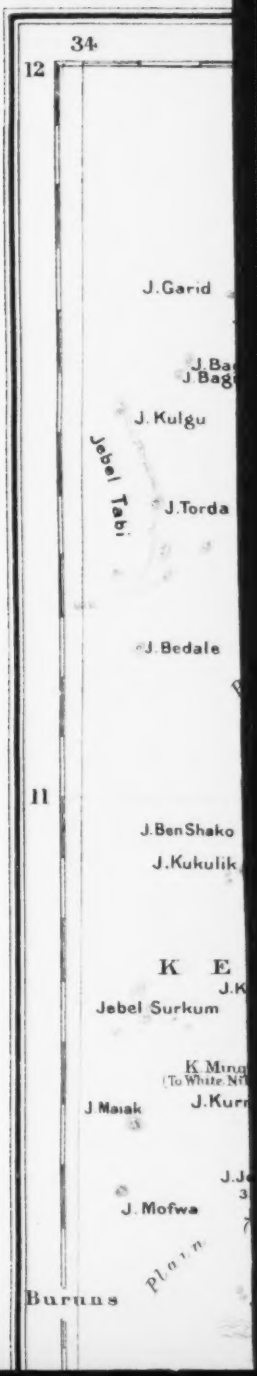
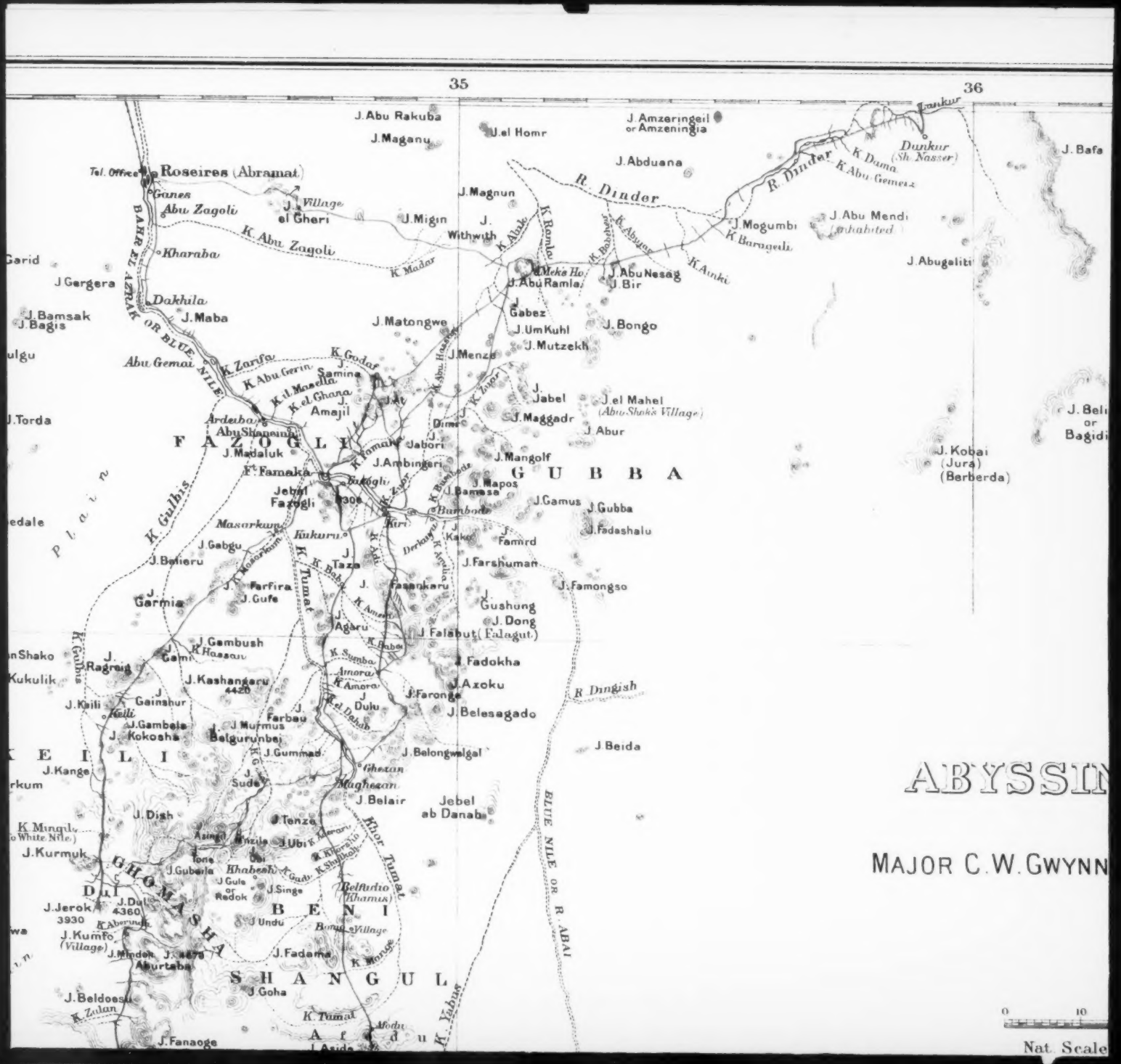
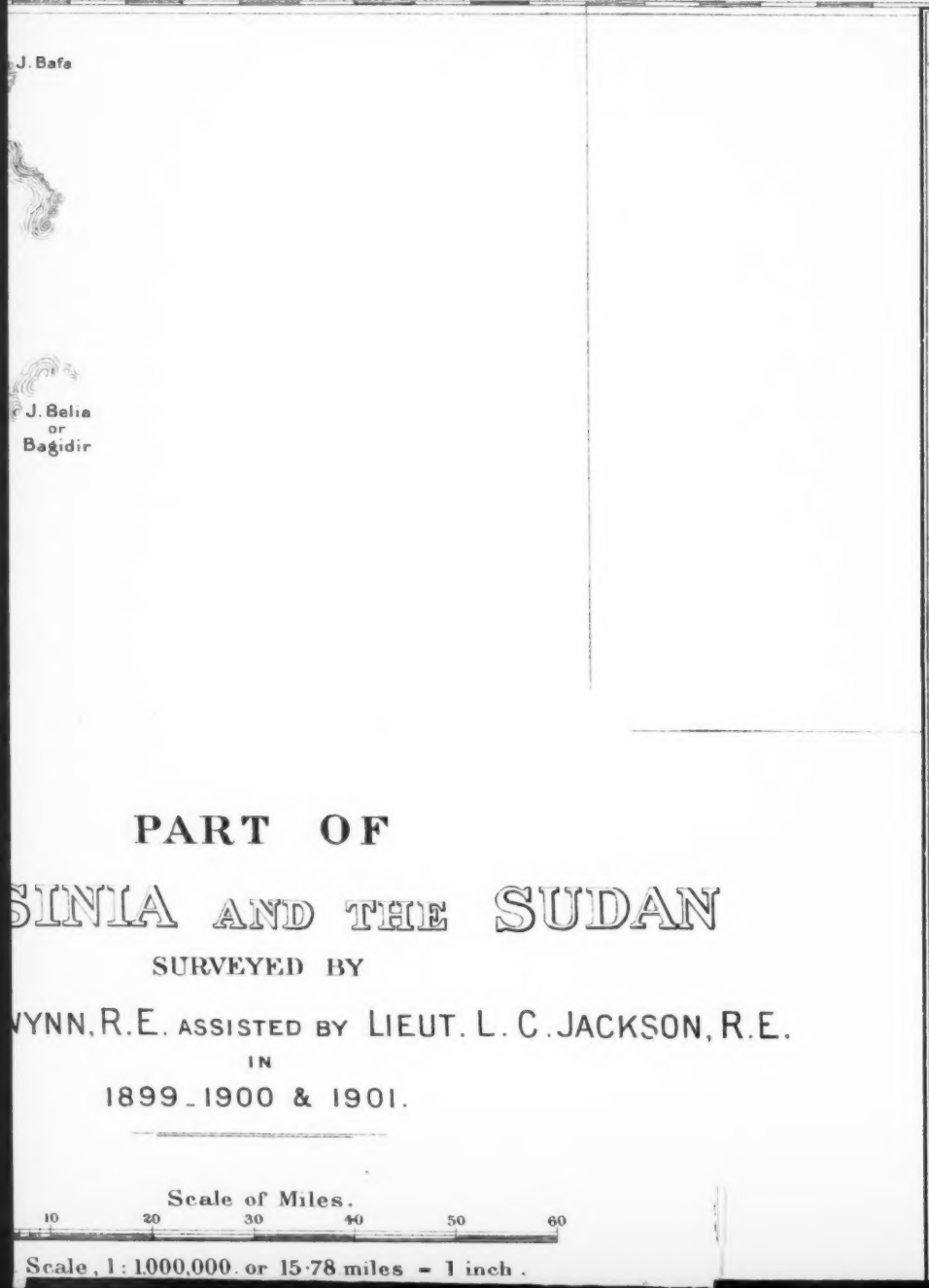
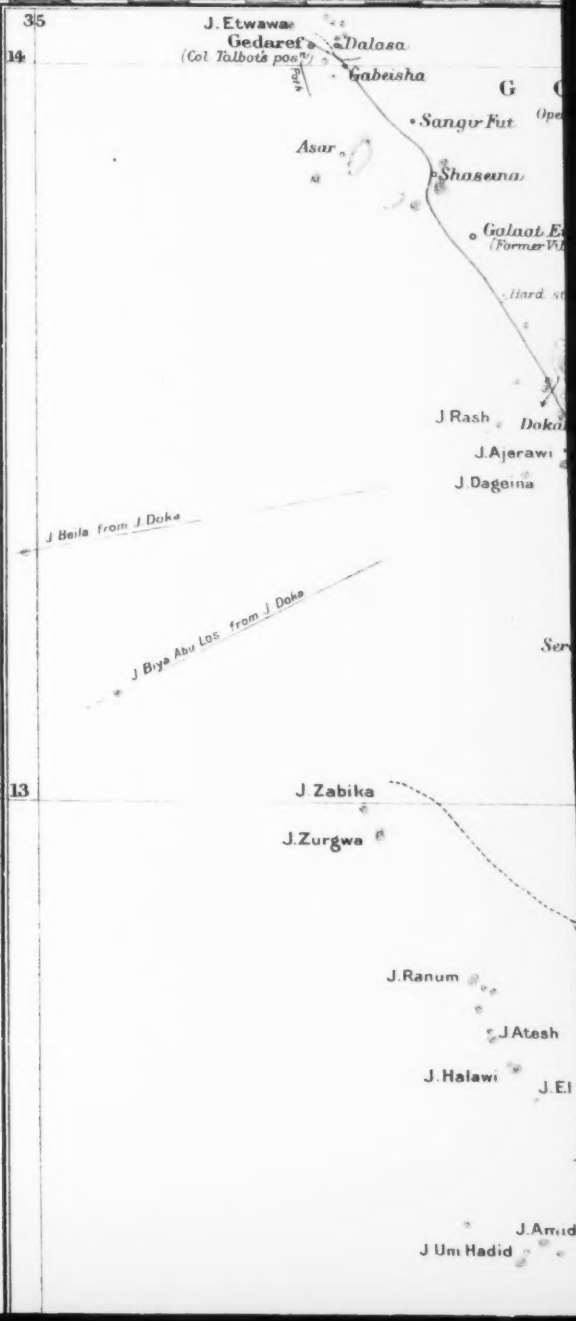
* Publication in progress.


34
12
J.Garid
J.Kulgu
Jebel Tabi
J.Torda
J.Bedale
11
J.BenShako
J.Kukulik
K E
Jebel Surkum
J.Mofwa
Plain
Burnns


35
36
Roseires (Abramat.)
Tel. Office
Ganes
Abu Zagoli
Kharaba
Dakhila
J. Maba
J. Village
el Gheri
J. Migin
K. Abu Zagoli
K. Madar
BAHR EL AZRAK OR BLUE NILE
J. Abu Rakuba
J. Maganu
J. el Homr
J. Amzeringeil or Amzeningia
J. Abduana
R. Dinder
J. Magnun
J. Withwith
K. Ablak
K. Ramla
K. Abuyar
K. Barageli
K. Ainki
J. Mogumbi
J. Abu Mendi (Inhabited)
J. Abugaliti
J. Meke's Ho
J. Abu Ramla
J. Abu Nesag
J. Bir
J. Gabez
J. Um Kuhl
J. Bongo
J. Mutzekh
J. Matongwe
J. Menza
K. Godar
K. Abu Gerin
K. el Masella
K. el Ghana
Samina
Amajil
Abu Shaneina
Ardeiba
Abu Gemai
K. Zarfa
F A Z O G L I
J. Madaluk
F. Famaka
Jebel Fazogli
1306
K. Gulbis
Plain
J. Jabel
J. el Mahel (Abu Shak's Village)
J. Maggadr
J. Abur
J. Mangolf
J. Ambingeri
J. Mapos
J. Bamasa
J. Gamus
J. Gubba
J. Fadashalu
G U B B A
J. Kobai (Jura) (Berberda)
J. Bafa
J. Beli or Bagidi
Dunkur (Sh. Nasser)
K. Dama
K. Abu Gemeza
R. Dinder
Jabori
Bumbado
Kuri
Kako
Famrd
Masarkum
Kukuru
Dirkum
J. Gabgu
J. Belieru
J. Taza
J. Farshuman
J. Famongso
J. Farfira
J. Gufe
Garmia
J. Fasankaru
J. Gushung
J. Dong
J. Falabut (Falagut)
Agaru
J. Gambush
J. Ragreig
J. Kashangaru 4420
J. Kaili
Gainshur
Kaili
J. Gambela
J. Kokosha
J. Murmus
Belgurunbei
Farbau
J. Fadokha
J. Azoku
J. Faronge
J. Belesagado
R. Dingish
J. Beida
K E I L I
J. Kange
J. Gummad
J. Belongwalgal
Ghezan
Maghesan
Sude
J. Belair
Jebel ab Danaba
J. Dish
J. Tenze
J. Ubi
Azingi
Mizile
Tone
Doi
J. Gubeila
Khabesh
J. Gule or Redok
J. Singe
Belfudio (Khamus)
K. Mingidi
J. Kurmuk
J. Jerok 3930
J. Dul 4360
J. Kumfo (Village)
J. Mindok
J. 4878
Aburtaba
G H G M A O H A
D U L
B E N I
J. Undu
Bonga Village
J. Fadama
K. Monge
S H A N G U L
J. Goha
J. Beldoesu
K. Zulan
K. Tumat
Afodu
J. Fanaoge
J. Aside
K. Yabus
Khor Tumat
BLUE NILE OR R. ABAI
ABYSSIN
MAJOR C. W. GWYNN
0 10
Nat. Scale





PART OF

SINIA AND THE SUDAN

SURVEYED BY

WYNN, R.E. ASSISTED BY LIEUT. L. C. JACKSON, R.E.

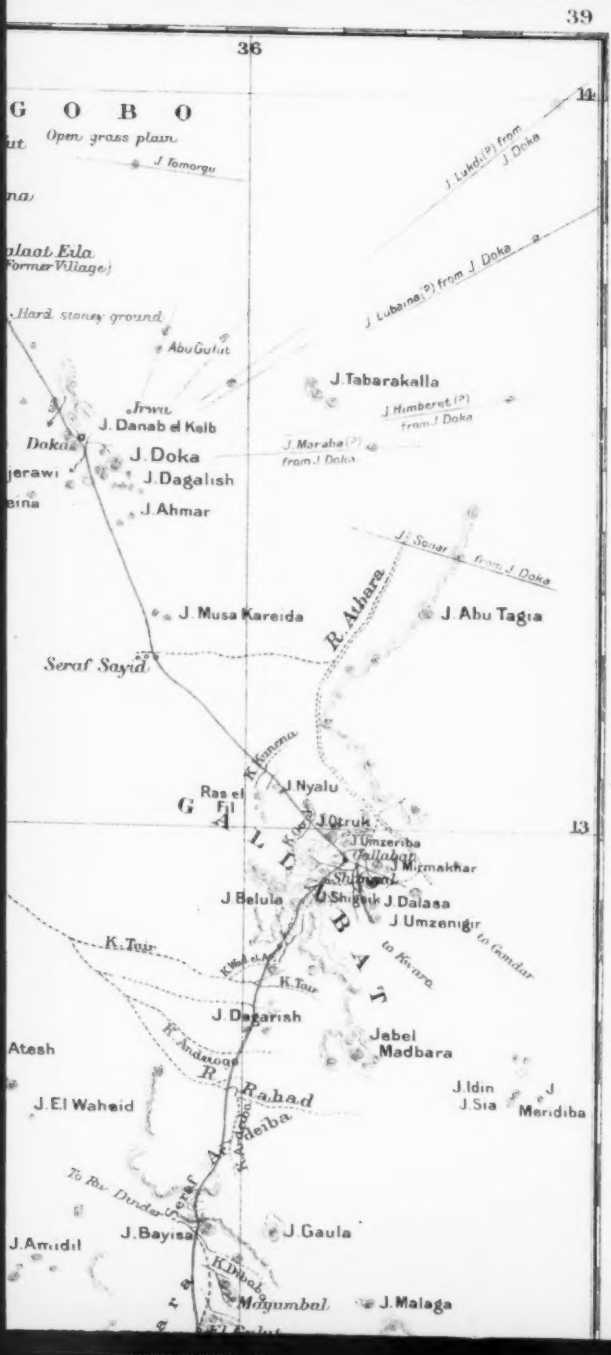
IN

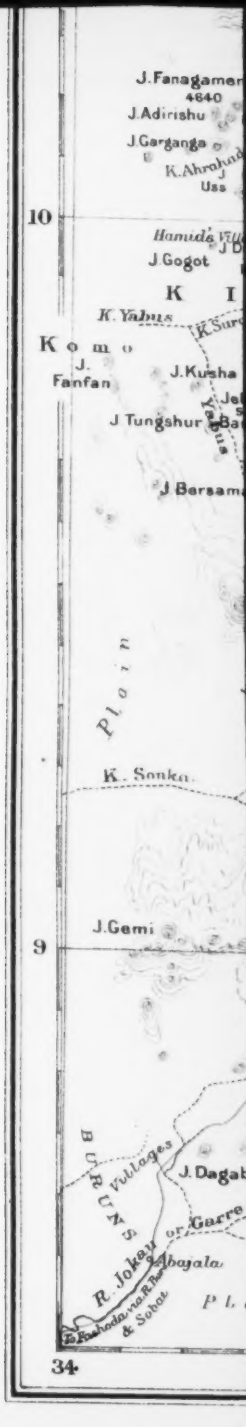
1899-1900 & 1901.

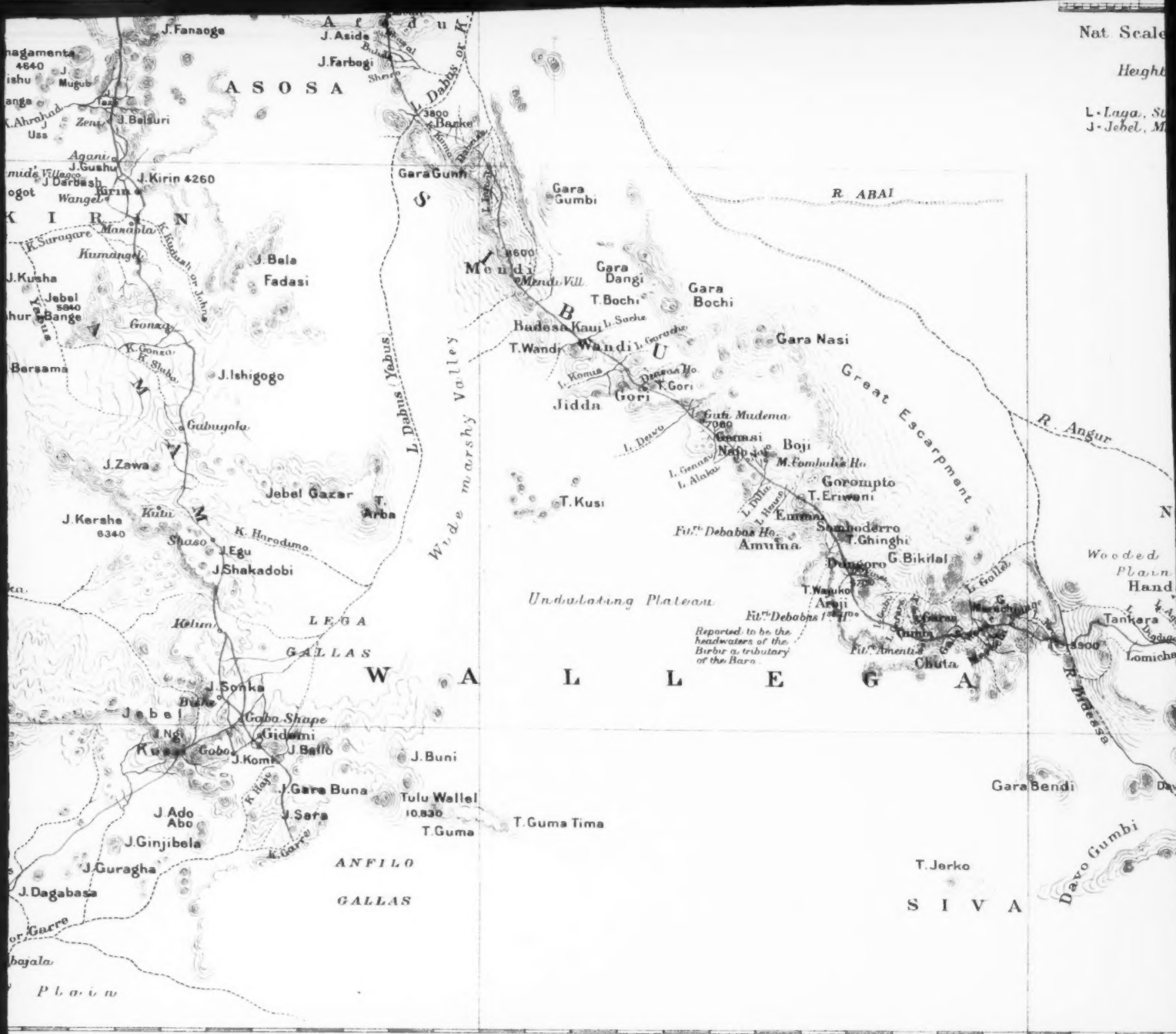
Scale of Miles.

10 20 30 40 50 60

Scale, 1 : 1,000,000. or 15·78 miles = 1 inch.

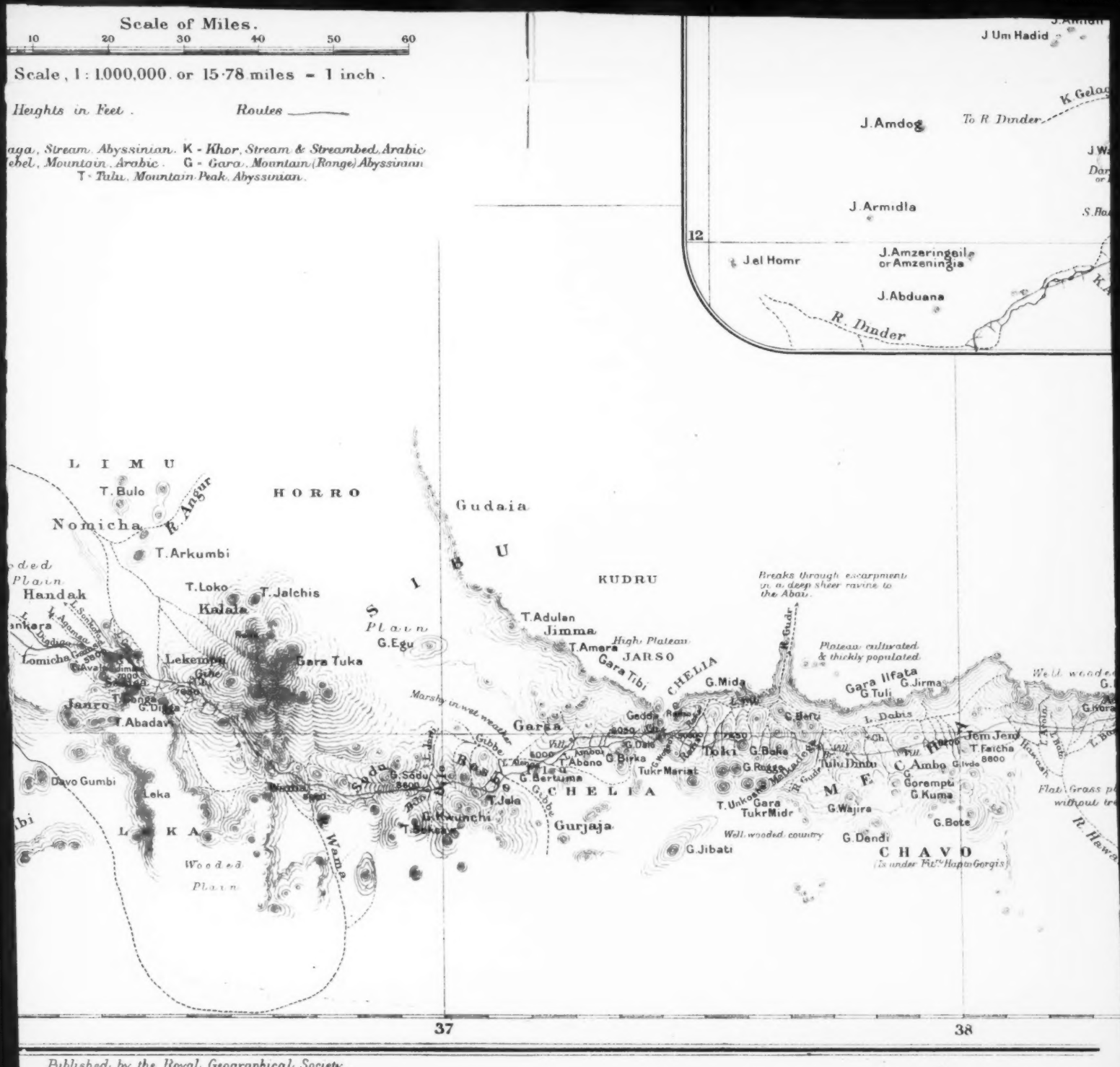

39
12
36
14
G O B O
Open grass plain
J. Tomorgu
J. Lakdi (?) from J. Doka
J. Lubaina (?) from J. Doka
Hard stony ground
Abu Gulut
J. Tabarakalla
J. Humberet (?) from J. Doka
J. Danab el Kelb
J. Doka
J. Dagalish
J. Ahmar
J. Maraba (?) from J. Doka
J. Sonar from J. Doka
J. Musa Kareida
J. Abu Tagia
R. Athara
Seraf Sayid
K. Komma
Ras el Fil
J. Nyalu
J. Otruk
11
13
G A L L A B A T
J. Umzeriba
Tallabat
J. Mizmakhar
J. Belula
J. Dalasa
J. Umzenigir
to Gondar
to Kwara
K. Tour
J. Dagarish
Jebel Madbara
Atesh
R. Rahad
J. El Waheid
J. Idin
J. Sia
J. Meridiba
To Ras Dunde
J. Amadil
J. Bayisa
J. Gaula
Magumbal
J. Malaga

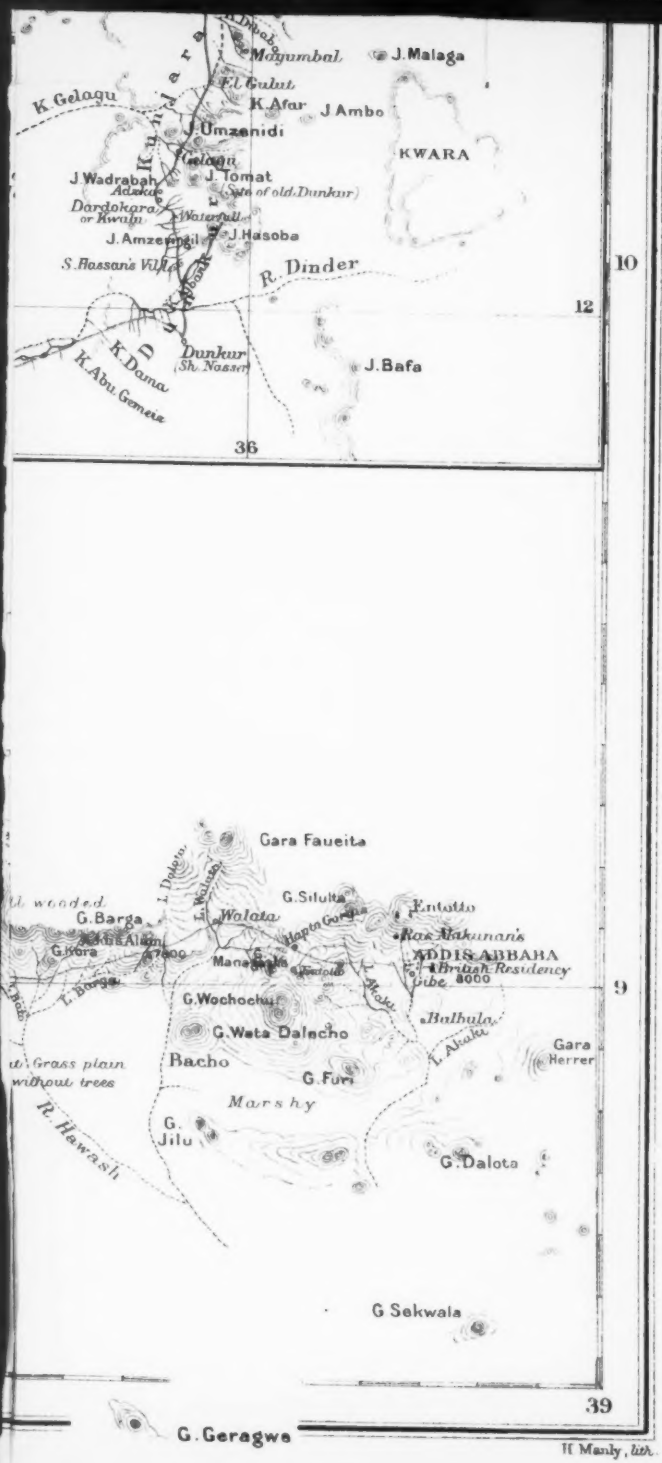

J. Fanagamer
4640
J. Adirishu
J. Garganga
K. Ahrohun
Uss
10
Hamida Vill
J. Gogot
K I
K. Yabus
K. Surc
K o m o
J.
Fanfan
J. Kusha
J. Tungshur
J. Bersam
Plain
K. Sonku
J. Gemi
9
B U R U N
Villages
J. Dagab
Garre
R. Jokay
Abagala
Fashadana R.
& Sohat
34


Nat Scale
Height
L. Laga, Su
J. Jebel, Mt
J. Fanaoge
J. Aside
J. Farbogi
A f d u K.
L. Dabus or K.
ASOSA
J. Mugub
J. Belsuri
J. Gushu
J. Kirin 4260
Gara Gunti
Gara Gumbi
R. ABAI
K I R I N
Maraba
K. Suragare
Kumangel
J. Bala
Fadasi
J. Kusha
Jebel 5840
Bange
Gonzay
K. Gonzay
K. Shako
J. Ishigogo
Bersama
Gubugola
J. Zawa
Jebel Gazar
T. Arba
J. Kersha 6340
Kutu
Shaso
K. Horodumo
J. Egu
J. Shakadobi
Wide marshy Valley
L. Dabus Yabus
Meudi 8600
Meudi Vill.
Gara Dangi
T. Bochi
Gara Bochi
Badesa Kau
T. Wandi
Wandi
Gara Nasi
L. Komua
Jidda Gori
T. Gori
Great Escarpment
R. Angur
Gutu Mudema 7080
Gemasi
Nabo Jebe
Boji
L. Genasi
L. Alaka
M. Combulta Ho.
Gorompto
T. Eriweni
T. Kusi
Emma
Sambodorro
T. Ghinghi
Fit.h Debabna Ho.
Amuma
G. Bikilal
Dengoro 7750
Undulating Plateau
T. Wanko
Angji
Fit.h Debabna Ho.
Reported to be the headwaters of the Birbir a tributary of the Baro
Chuta
Tankera
Lomicha
Wooded Plain
L. Gollal
R. Maessa
W A L L E G A
HELUM
LEGA GALLAS
J. Sonka
Jebel
Buke
Gaba Shape
Gidami
J. Ngi
Kusa
Gobo
J. Komi
J. Bello
J. Buni
J. Gara Buna
Tulu Wallel 10,830
T. Guma
T. Guma Tima
J. Ado Abo
J. Sera
J. Ginjibela
J. Guragha
J. Dagabasa
ANFILO GALLAS
Gara Bendi
T. Jerko
S I V A
Davo Gumbi
Plain

35 36

Publis

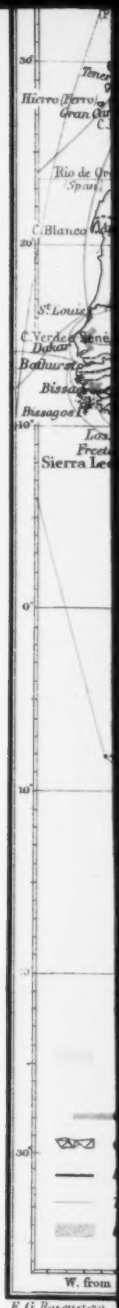

Scale of Miles.
10 20 30 40 50 60
Scale, 1 : 1,000,000 or 15·78 miles = 1 inch.
Heights in Feet.
Routes
aga, Stream Abyssinian. K - Khor, Stream & Streambed Arabic
ebel, Mountain Arabic. G - Gara, Mountain (Range) Abyssinian
T - Tulu, Mountain Peak Abyssinian.
J Um Hadid
J. Amdog
To R. Dinder
J. Armidla
J. el Homr
J. Amzeringaile or Amzeningia
J. Abduana
R. Dinder
12
L I M U
T. Bulo
HORRO
Nomicha
R. Angur
T. Arkumbi
Handak
T. Loko
T. Jalchis
Kalala
Lomicha
Lekempti
Gara Tuka
Janro
T. Abadar
Davo Gumbi
Leka
L E K A
Wooded Plain
Gudaia
S I B U
Plain
G. Egu
KUDRU
T. Adulan
Jimma
T. Amera
JARSO
Gara Tibi
CHELIA
Breaks through escarpment in a deep sheer ravine to the Abai.
High Plateau
Plateau cultivated & thickly populated
G. Mida
Gara Ilfata
G. Tuli
G. Jirma
C. Beru
L. Dobis
Marshy in wet weather
Garsa
G. Dalo
T. Abono
G. Birka
Tukr Mariat
Doki
G. Bake
G. Rossa
Tulu Dinbu
C. Ambo
Gorempti
G. Kuma
G. Wajira
G. Bote
G. Dandi
CHAVO
(is under Fit. Hapa Gorgis)
Well wooded country
G. Jibati
T. Jela
Gurjaja
G. Kwunchi
T. Sukera
G. Sadu
Bumbi
Wama
Gudda
Gibbe
Bale
R. Hawash
Flat Grass p without tr
37
38
Published by the Royal Geographical Society


Mayumbal
J. Malaga
K. Gelogu
K. Afar
J. Ambo
J. Umzenidi
KWARA
J. Wadrabah
J. Tomat
Dardokara or Kwain
Waterfall
J. Amzengil
J. Hasoba
S. Hassans Villa
R. Dinder
10
12
K. Dama
Dunkur
J. Bafa
K. Abu Gemeis
36
Gara Faueita
G. Barga
Walata
G. Silulta
Entotto
Ras Makunan's
ADDIS ABBABA
British Residency
8000
G. Wochochur
G. Wata Dalacho
Balhula
Gara Herrer
Bacho
G. Furi
Marshy
R. Hawash
G. Jilu
G. Dalota
G. Sekwala
9
39
G. Geragwe

H. Manly, lith.

40°
Azores
St Michael
Ma
35°

JOURNAL ROYAL GEOGRAPHICAL SOCIETY



E. G. Ravenstein

Reference.
Territories of which a detailed survey based upon a Triangulation has been made.
Coasts and Rivers surveyed in detail.
Chains of Triangles outside Territories surveyed in detail.
Boundaries surveyed by International Commissions.
Telegraphs and Cables.
Unexplored.
W. from 20° Greenwich
10°
0°
10°
20°
Equator
Tropic of Cancer
Ascension (Brit.)
St Helena (Brit.)
Canary Is
Morocco
Fezzan
TRIPOLI
Sahara
Kawar
Air (Azben)
Adrar
Senegambia
Liberia
Mossi
Wasulu
Jallon
Futa
Ashanti
Dahomey
Adamawa
BORNU
Kanem
Wadai
Bagirmi
Bornu
Bodele
Hausa
Sokoto
Gando
Kano
Zinder
Burrum
Kukawa
Massenya
Yola
Bida
Nupe
Borgu
Yaruba
Gando
Timbuktu
Kabara
Jenne
Bandiagara
Massina
Segu
Sansanding
Niore
Bamba
Kankan
Sierra Leone
Freetown
Monrovia
Cape Palmas
Grand Bassam
Assinie
Elmina
Cape Coast
Accra
Porto Novo
Lagos
Benin
Old Calabar
Akassa
Fernando Po
Cameroons
Princes I.
St Thomas (Port.)
Annobom (Span.)
Gaboon
Corisco
Batanga
Bangala
Bangi
Mobangi
Ba
French CONGO
Congo
Francheville
Libreville
Sette Kama
Loango
Kabinda
Banana
Boma
Ambriz
Loanda
Kwanza
Ambaca
Benguela
Bihe
Mossamedes
Huilla
Humbe
Kimene
Damara Ld
Walvisch B.
Sandfish B.
German South West Africa
Angra pequena
Orange R.
Cape Town
Lunda
Lobale
Ndara
Zambesi

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